A WARNING!

IF YOU have not already done so, get a copy of the Robinson-Patman Act which was approved June 19 and signed by the President on June 20. Read it carefully and then consult your attorney.

This Robinson-Patman Act is a piece of the most revolutionary legislation ever passed by any Congress. It was one of the few pieces of "must" legislation demanded before the adjournment of the 74th Congress.

It drastically affects every manufacturer, wholesaler, retailer, chain or independent store organization in the country. It was not conceived in a hurry. It is a combination of four bills that have been before Congress during the past two years or more.

It is known generally as the Anti-Discrimination Price Law.

Under the provision against "discrimination in price," the government seeks to control and supervise every process and procedure in the production of a commodity from its raw material assembly to its ultimate market destination. This control would be more drastic and more far reaching than the NRA. The more it is studied, the greater its ramifications appear.

Frankly, we are amazed at the seeming apathy with which manufacturers have regarded it. Hence this warning.

It is not sufficient to dismiss this bill with the trite saying: "it is unconstitutional."

It is perfectly safe to say at this writing, that this bill will disrupt and drastically change trade practices in America. It will probably take a year to eighteen months before any authoritative judicial interpretation can be had.

In the meantime, we call attention to the fact that this is an enactment of Congress according to constitutional provision, and is as enforceable as the Interstate Commerce Act or the Tax Law, until it, or any of its parts be held invalid.

What is price discrimination? What constitutes commercial and legal discrimination?

What is price? What constitutes a commercial and a legal price?

The Act provides that competitors are guilty of discrimination when the effects may be:

1—Substantially to lessen competition

2—To tend to create a monopoly,

3—To injure, destroy or prevent competition with any person who either grants or knowingly receives the benefit of such discrimination or with customers of either of them.

The third expression, "To injure, destroy, or prevent competition with any person" is a new and sweeping additional provision to the Anti-trust Law.

What does it mean? Whom does it affect and how will it affect them?

It is also true that at this early date none of the leading legal minds of the country agree on an interpretation of this Act and its sequences.

It may be that this Act is a legal monstrosity, but it is recognized that it is the final legislative expression of the deep discontent that has been manifesting itself for many years regarding commercial and trade practices in this country. We believe that this is but the genesis of such legislation.

As we view it now, you cannot depend upon your trade association for guidance under this Robinson-Patman Act. See your lawyer early.

+ EDITORIAL +

That Matter of Vacations

GEORGE A. MARTIN, President of the Sherwin Williams Company, stated in a recent interview that his company had arranged to give vacations to all hourly wage employees under the same conditions as clerical help. Such a policy means that all employees who have been with the company a year will receive a week's vacation with pay; while employees with a service record of five years will receive two weeks vacation with pay.

For a long time past, it has been rather common practice for industrial establishments to give vacations with pay to office workers and to the executive personnel. It has not been so common, however, for vacation periods to be granted to hourly wage production workers. In fact, a survey made by the New York State Department of Labor covering vacation policies of factories within the state, and published in a bulletin issued by the department in July, 1925, revealed that vacations were given to office workers in 91 per cent of the plants, to foremen in 68 per cent, and to production workers in 18 per cent.

When classified by industries it was revealed that of the plants co-operating in the study (1,500 of them) the paper industry had a vacation policy for production workers in 18.1 per cent of the plants. In other words, the percentage figure for paper mills having a vacation policy for production workers approximates the average figure for all of the plants contributing to the survey.

It probably would be safe to assume that what was learned of vacation policies of paper manufacturing concerns in New York State at the time of the survey would apply equally well to the other papermaking states of the country. The intervening years, likewise, have probably shown little tendency for the industry as a whole to alter the existing way of doing things.

It may be that your concern grants vacations to the men in the mill as well as to the office and executive personnel, but the odds as revealed by the previously mentioned survey are against you. If you do not grant such vacations, might the suggestion be made to take a tip from Mr. Martin, an executive in the paint industry, and see what can be done about it?

Should some suitable plan be worked out, it is believed that all employees would respond to it; and that it would be a step in the forward movement of the paper industry.

Machinery and the Paper Industry

IN THE opinion of many people, the introduction of machinery in industry is contrary to the best interests of labor. Proponents of this thought claim that labor is thrown out of employment through the use of machinery of improved design and that an unemployment problem develops as a result.

Such a thought is not new to the paper-making industry. In fact, when Marchant Warrell put into operation the first commercial paper machine, he did so at the risk of his life. Rioting workmen, fearing the competition that the machine would bring, attempted to burn the mill and otherwise prevent the successful operation of the machine.

Warrell, however, ran the machine. He proved its practicality.

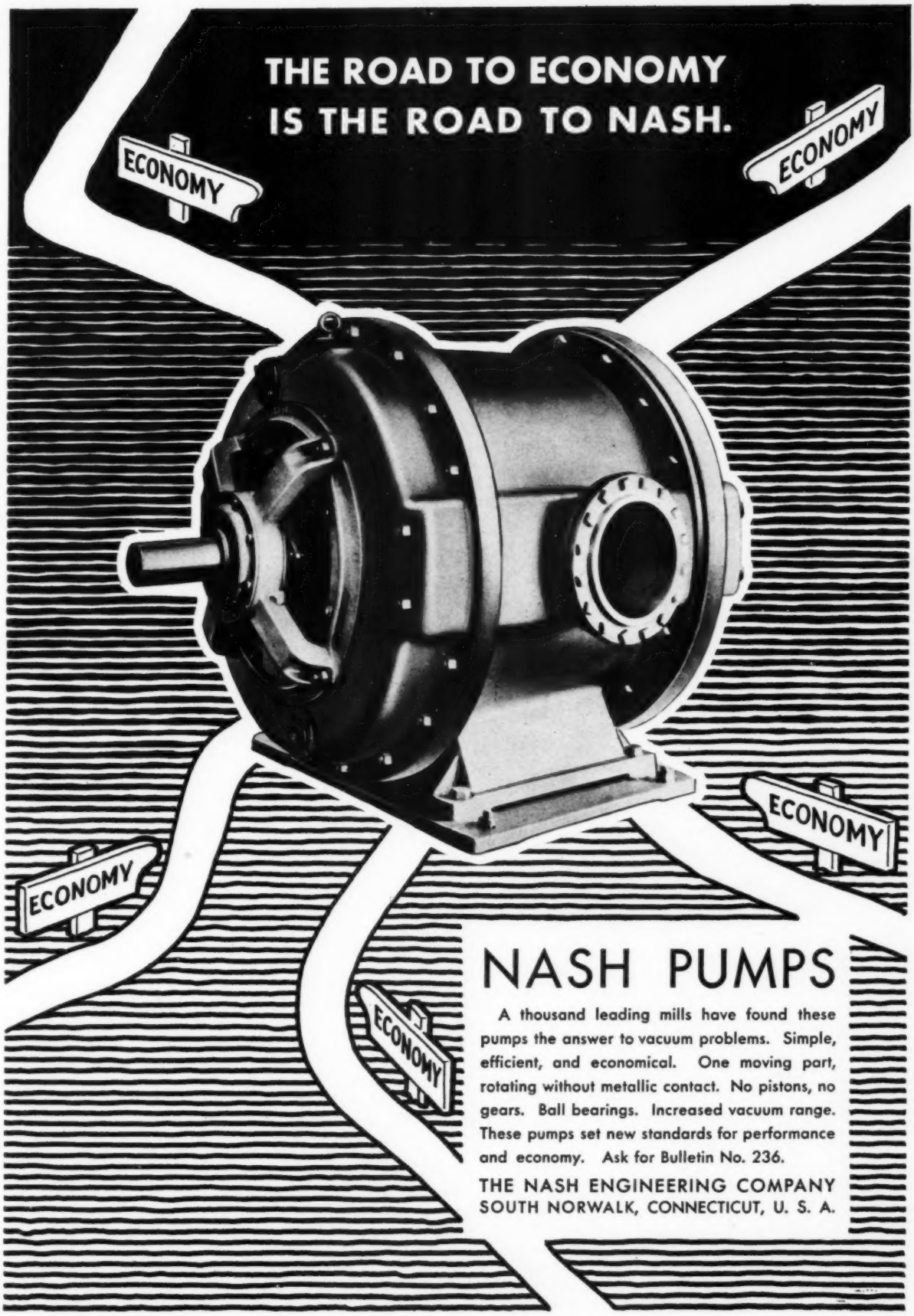
This act on Warrell's part probably is deserving of the acclaim not only of the paper industry but of the world. Had the trial ended in failure, it most certainly would have delayed progress and the industry as it is known today might never have developed.

In fact, the introduction of the paper machine permitted paper to be produced more cheaply, and this in turn caused more of it to be consumed. In the United States alone the annual per capita consumption of paper increased from one pound in 1810 to 220 pounds in 1929.

Would this increase in consumption have been possible had papermakers continued to make paper by hand? It is not believed so.

This increase in consumption, however, brought about an expansion of the industry, and a need for mechanical and technological improvements in the ways of making paper. Together they have resulted in increased employment within the industry and within the allied fields to supply pulp and paper mills with necessary machinery and supplies for operation. At the same time have come shorter working hours, more pay, and better working conditions for labor.

May such progress continue!



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THE NASH ENGINEERING COMPANY
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"Man of Destiny" vs. "Common American"

WILLIAM SIBLEY

BEGINNING right now we are entering the active part of a presidential campaign, the battle of which is between a man who considers himself a "man of destiny" and one who knows himself to be only a "common American." Mr. Roosevelt constantly sought the presidency of the United States, in spite of the fact that while Governor of New York he was considered by his co-politicians as the "boy-scout of politics." Mr. Landon admits that there are other men in every part of the country who are equally well qualified to be president and on two different occasions during the recent nomination campaign he told any and all of his backers that he would either have the answer to his argument his way or he was perfectly willing to go back to the job of being Governor of Kansas.

We all know something of Roosevelt; albeit that something is very little. . . . Because when a man ascends to the presidency there are thrown around him legends which distort and discolor the incumbent all out of recognition to the original. He is subject to unjustified eulogies by admirers and unjust criticisms by his opponents. If, next November, Landon should be the man who is to have "rendezvous with destiny" he too will be lauded and disparaged, distorted and discolored. Let's try to analyze the man, now, before the pros and cons get to work on him.

For the highly polished and cultured Mr. Farley to dismiss Mr. Landon with his contemptuous "nonentity" was both political impudence and social offense. Although Mr. Farley is far superior to Landon as a practical politician (in the Tammany sense of the word), Mr. Landon is as far above Mr. Farley as a real man as a TWA plane is above the Sante Fe Chief at Topeka. Mr. Landon is by no means a nonentity. He is an intelligent, well-informed, clear-headed man endowed with a lot of common sense. Compared with Mr. Roosevelt he is a poor speaker. He does not know the tricks of the platform; he understands little of mob psychology. But what he says is straight-forward and clean-cut—as sharply defined as a Coolidge statement; as logical as Elihu Root. He is by no means a back-slapping, call-me-by-my-first-name politician. But his political philosophy is both concrete and cement hard. He neither poses nor gestures; he grows no publicity whiskers; he doesn't put each member of his family in a contest to see which can get the most newspaper lineage; he does nothing to attract attention to himself in a crowd; he monopolizes no conversation; and he is anything but "swell-headed." But he is a hard-questioner; and enjoys the power of concentration; he is quick of perception; he seeks advice but doesn't always take it; and not infrequently exercises to its full capacity his Pennsylvania Dutch stubbornness.

In Boston, Coolidge had a lot of acquaintances and enemies who would retail whispers about his bad habits and disabilities. In Topeka, Landon knows a lot of men who wholesale such whispers. But those same political enemies know Landon well enough to respect, to hold in high regard, and even to admire the man they are disparaging. And there are few better testimonials for a man's character.

If elected next November (which I hope but doubt), what a job Landon has picked for himself! I'm genuinely glad it isn't to be mine. I would rather be a stalwart hollyhock—one of those colorful pilferers of the rainbow—bowing my gaily uniformed head over the back fence, than to be president for the next four years. The only thing certain to come to that president is grief. He will start with an umpty-steen billion dollar deficit (we call it thirty-two, but goodness knows what an Ernst & Ernst could find in our present system of double-entry bookkeeping). He will have the opposition of a badly split-up congress. He will enjoy the harvest of a four-year depression capped by an unprecedented two-year drouth. He will inherit a credit inflation already well started, and a four-to-six chance of a federal counterfeit money inflation before we are out of this mess. He will face a Europe, each country of which is using every diplomatic means at its disposal to spar for time in order to better prepare for the war that now seems inevitable. Oh boy! What a job! He can have it. . . and I hope he gets it.

. . . Because if he doesn't, currency inflation is coming just as certain as tomorrow's sun, and what Mr. Roosevelt will do the constitution of this country through the appointment of new judges to the Federal Supreme Court Bench is not to be contemplated without awe. With another four years of Mr. Roosevelt there will be visited upon every giant industrial concern legislation compelling dissolution, and upon every small industrial concern political persecution in the form of excessive taxation. Mr. Roosevelt is a reformer, a "man of destiny," a man so consumed with ego that he firmly and sincerely believes it is impossible for us to continue without him, or without the "benefit" of the acts he will impose. That eleven out of twelve of his recent acts have been thrown into the discard by the Supreme Court bothers him not at all. He will re-instate those acts if he has to remake the Court.

In contrast, Mr. Landon thinks of himself as a "common American"—of his job as being one which only clear-headed, clean-thinking common sense will solve. In his opinion panaceas should be panned; reforms should be performed before application. Personally, I am inclined to favor the common sense "common American."

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THE PAPER INDUSTRY
A MONTHLY EDUCATIONAL JOURNAL

Russia Today as Seen by a Papermaker

HARRY S. SPENCER, Manager
Howard Smith Paper Mills Ltd.

A VISIT to Russia today is especially interesting because of rapidly changing conditions in that great country. Some very modern paper mills are being built. One of these, under construction at Balagna, I could have seen, but my attention was confined to those mills which have not yet been under the influence of "the plan."

We flew from Berlin to Moscow, leaving the airport at 7:00 a. m., which meant breakfast at 5:30. Several stops were scheduled, the last one being for 1:30 p. m. where we had been told we could have lunch. Due to unfavorable conditions on the landing field, our plane did not stop as scheduled and we flew for ten hours without food. Late in the afternoon we landed at Moscow on a field of ice. Some of the planes were equipped with skis.

There were only four of us to go through the customs and after filing into a small room with our baggage we waited for ten or fifteen minutes while the stolid Russian customs official kept writing at his desk without a welcoming nod to us or even the slightest sign of recognition. Finally he got up, brushed past us, walked over to the door and locked it. Then he returned to examine our baggage.

He started with my brief case which was open. He emptied the contents on the counter. Each individual article was examined before being put back into the case; envelopes were opened and a most thorough examination was made. This method of inspection was used with the remainder of the baggage and it took well over an hour for the examination of the baggage of four persons, all traveling light.

As we were traveling by the "Intourist," the state-owned travel system, we were met by an interpreter and an American car (a Lincoln) which took us to the first class hotel we had previously chosen.

When we arrived at the hotel about 7:00 p. m., our first thoughts were for a quick clean up and a good dinner. We told our interpreter we would like to go to our rooms as quickly as possible and we were amazed when he replied that the room clerk was out to dinner and we would not be able to get rooms until he returned. They admitted having received telegrams notifying them of our arrival but they were adamant in their refusal to do anything for us in the absence of the room clerk.

Being faint from hunger, we told them we would have our dinner while waiting for the room clerk to return, and we were then shown to the dining room which was upstairs. After we had been seated, we were asked for our tickets and found to our utter dismay that we could not eat and pay afterwards—the rule was "pay before being served." We explained

Three years ago, Mr. Spencer toured Europe visiting a large number of manufacturing plants, more than half of which were paper mills. He investigated paper machines in England, Scotland, Germany, Jugo-Slavia and France. He has recently returned from a second tour over much of the same territory, adding Russia to his itinerary. This article sets forth conditions observed by him while visiting different paper mills in Russia.

that we had no tickets and were told that we could not be served. Again in the lobby we appealed to our interpreter who explained the situation by saying that the Intourist office in Berlin had forgotten to give us tickets. We told him we had not eaten since 5:30 that morning and suggested that he try to fix up the matter of the tickets after we had dinner. He flatly refused with the statement that this was out of the ordinary routine and that nothing could be done until the room clerk returned from dinner. This actually happened in a first class hotel in Moscow, owned and managed by the Intourist organization with which we had booked. Our insistence finally won a compromise in the way of temporary tickets—and that took plenty of time. Fortunately, all Russian hotels are not exactly like this one; the Intourist hotel in Leningrad is more comfortable and the clerks more competent.

The tremendous shortage of various commodities is noticed in such articles as common bleaching powder. The linen table cloths on examination seemed clean enough but without bleach, were a dull gray. The waiters' jackets instead of being a pure white were dingy and unattractive. There was always plenty of food but it was served under conditions that were not always appetizing.

We soon learned that service such as we were accustomed to just didn't exist in Russia. This is due partly to a lack of knowledge of better methods and partly because of the fundamental difference in the Russian mentality. I don't think we had any meal in Russia served in less than two hours and it was frequently three hours. Regardless of our urgent requests for more speed, it seemed that it just couldn't be done. They did not seem to understand why we were in a hurry, and often waiters would disappear after taking an order. We finally decided there was nothing to do except make the best of it. A Swedish engineer we knew always took a book with him into the dining room. We finally learned to order a meal an hour before we wanted to eat, and this helped some.

Traffic Conditions

The traffic lights in Moscow are very similar to ours at the main intersections. However, when starting to cross with the green light, the light turned red before we were able to reach the other side. On one crossing I timed the green light and found to my amazement that it was green for twelve seconds only. This caused a tremendous horn-honking as the traffic lights change so quickly that it is impossible to regulate pedestrian traffic. They actually are unable to cross the wide streets in time, with the result that people walk indiscriminately across the streets with practically no regard for the lights and the automobiles honk their horns constantly while weaving in and out to miss pedestrians.

This is typical of many things the Russians are doing. They have the desire and the aggressiveness to adopt modern equipment, but as yet, are handling it very imperfectly.

Conditions Under the Five-Year Plan

Our first morning in Moscow was spent at the British Embassy in the office of the Commercial Counsellor, who was very well informed on business conditions in Russia. When I commented on the dilapidated condition of the public buildings and the poor quality of clothing, his answer was "You should have seen this country five years ago."

The Counsellor explained that after the great War, Russia had been very much demoralized. This was followed by its civil war which disorganized the country to an almost unbelievable extent and it took many years to even get the public services on an operating basis. The water system in Moscow had broken down under the lack of attention and this was rather typical of the terrible disorganization which had taken place throughout the entire country.

The railroads had almost entirely ceased to function —probably ten or fifteen per cent were still operating at the end of their civil war. Under these conditions, it can be seen that tremendous difficulties faced the leaders of new Russia in their work of getting the country back to normal.

I was shown their paper production figures which today represent approximately ten pounds per year per capita for all grades including newsprint. When it is realized that the consumption of newsprint paper alone is many times this figure in this country and most European nations, it can be seen that the paper shortage in Russia is very real and, in spite of increasing production schedules, is bound to be severe for several years to come.

The first five-year plan stressed the heavy industries such as iron, coal, tractors, etc., and the lighter industries were left in the background, in comparison. On the completion of the first plan, the second five-year plan was inaugurated to include paper, textiles, rubber, etc., and it seems only reasonable that the paper industry will advance more rapidly during the next few years than it has in the past. The quality of clothing no doubt will improve and the standard of living unquestionably will be raised.

An Interview with the Commissar of Foreign Trade

At the British Embassy they arranged an interview for me with Mr. Rabinovitch, Commissar of Foreign Trade, which was a distinct honor as Mr. Rabinovitch is one of the busiest and most influential men in the U. S. S. R. today. He was formerly head of the Russian Trade Delegation in London, and after spending but a few minutes in his office one realizes that he is a business man of outstanding qualities. As he speaks perfect English, it was easy to follow his description of business conditions.

Paper Shortage—My first question put to Mr. Rabinovitch was concerning the great shortage of paper which was very evident in the hotels and the stores. I asked why they did not import more paper to alleviate this condition and his reply was in the form of an explanation of the present policy of Russian foreign trade. Mr. Rabinovitch stated that they did not intend to become an importing nation and that excessive imports would be too competitive for the present condition of their industries which needed time for proper rehabilitation.

Shall We Fear Imports from Russia?—My next question was whether or not the western world had

anything to fear from an influx of goods exported from Russia when her industries get started on mass production. Mr. Rabinovitch was very emphatic on this point and stated that Russia had no intention of becoming an exporting nation and that western countries had no reason to fear that their markets would be flooded with cheap Russian merchandise. He claimed that Russian industries were increasing in efficiency and were being organized so that they could turn out huge productions and make their country practically self sustaining. This tremendous production was, however, to be used for the improvement of the standard of living of the Russian people. He told me that if I returned to Russia several years later I would see that the standard of living would be materially raised; that people would be better dressed and that the masses would have more leisure for the pursuit of cultural attainments.

The Government's Business Policy—Mr. Rabinovitch then explained briefly the business policy of the Russian government. It was to the effect that exports are to be kept at a minimum and are to be used only to pay for imports which will be reduced to the lowest possible level. In paying for these imports, they will export the most convenient commodity. For example, if they have a surplus of wood pulp, this will be exported. If they cannot derive sufficient income from this, they will export coal. If not coal, they will use any other form of merchandise which suits their requirements at the time.

This would seem to be an explanation of their exporting practice in recent years where they endeavor to sell, not at a competitive price, but at a figure necessary to provide a proper income for payment of imports.

Mr. Rabinovitch pointed out very clearly that they intended to use their natural resources for the improvement of Russia and not for other countries. He referred to fuel oil which had been exported in sizable quantities. Last year their exports were reduced because of the increase in the number of tractors, of which they have manufactured more than any other country in the world. It was his expectation that during 1936 the increased number of tractors would require more fuel oil and he doubted if there would be any at all for export. He stated this condition was true of many other commodities.

Operation of Industrial Units—My next inquiry was regarding their organization for operating industrial units; i.e., since all industry is owned by the state, who operates their factories and to whom do they report? The answer was that while their industrial plants conform to certain government regulations, they are operated on principles similar to those used in this country.

Referring to paper mills, I was told they had their own department which supervised all Russian paper mills and Mr. Rabinovitch gave me a letter of introduction to their director. When I arrived at his office, I was very courteously received, although he was presiding at a conference of several mill managers to discuss mill operations exactly the same as we do.

The director spoke and wrote English and we discussed papers made in this country and those made in Russia where they are endeavoring to improve the quality. My request to visit mills was immediately granted and he suggested Balagna, which is one of the newest mills containing very up-to-date American equipment. It would have taken several days for the trip, and this fact, together with my desire to see Russian paper mills as they have been operating and are operating today, caused me to decide against going to Balagna.

A Visit to Russian Paper Mills

Since I was going to Leningrad, I chose three mills near that city—one newsprint, one kraft and one specialties. The director arranged by telegram to have these mill officials get in touch with me at my hotel in Leningrad which they did the following morning.

A Five-Machine Newsprint Mill

The first mill I visited was one of five machines, all on newsprint. Their largest was a 160-inch Voith installed in 1928. The tachometer was reading in meters and the speed was equivalent to 825 feet per minute, and operating quite smoothly. They did not manufacture their own sulphite pulp but received this in baled laps. They had no shredders and the laps were fed directly into old style Hollander beaters sheet by sheet. This operation was carried on by four women —two feeding in the laps, one poking the laps under the roll with a broom handle, and the fourth screening the clay, assisting it through the mesh with the business end of the broom. About half the employees in the beater room and almost half those in the machine room were women. Both the machine tender and the backtender had a female assistant and there was another on the winder.

On returning through the machine room about twenty minutes later I found the stack shut off and the felts being washed. They had no felt cleaners except a pair of squeeze rolls on the first felt. There was no suction couch or press rolls, a top couch being used. When the stack was turned on, they quickly got it to the last press but experienced trouble in getting the tail into the Sheehan rope carrier. After the backtender had failed to take over the paper, the machine tender tried his hand at it and was followed by several other members of the crew. After ten or twelve minutes had passed without success they slowed the machine down to 600 ft. per min. and when the paper was near the calender stack the machine tender then increased the machine speed to 825 ft. per min.

The manager was quite frank in stating previously that they were having difficulty in operating without breaks and asked for any suggestions I might offer. I had observed that the first felt was going into the nip practically level or on a slight upgrade instead of traveling downward to prevent the water from creeping back in the felt. He thanked me for this information and thought this change would prevent the felts from getting dirty so frequently.

The dryer stack, while of the conventional design, had no hood over it and there appeared to be little being done for conservation of heat or fiber. Woolen dryer felts were being used on this machine and on all others I saw in Russia.

The calender stack was not provided with the equipment such as we use in this country for getting even caliper rolls. The paper reel, however, was more level than I would have expected when so little attention was given to it. The soft edges were sufficient to prevent it being run satisfactorily on a high speed press. Later in Leningrad, I saw a newsprint press operating at a speed not more than one-fourth of what is common practice in the United States.

The number of employees in all departments of these Russian paper mills is greatly in excess of what is seen in this country. This five-machine newsprint mill, without any sulphite mill, employed 1050 people. This did not include the workers in the toy department.

The toy department of this newsprint mill turned out toy horses, cows, chickens, etc., from the broken paper. Most of these workers were women who sat at benches, each with a pile of waste paper and two molds. The paper was moistened, then several layers placed in the half mold and pressed into shape. The two halves were then fitted together and more moistened paper wrapped around the whole object, which was then covered with starch by means of a brush and allowed to dry. After drying, it was dipped in color and in some instances subsequently hand painted. These finished articles looked surprisingly good, especially the chickens, which were hand painted. I was introduced to the head artist, an elderly woman who painted on the wings and other colorings, giving the finished article a very artistic appearance.

Kraft Mill Showed Neglect

The kraft mill I visited was situated near enough to Leningrad to be reached by automobile in two hours. The paper mill sent a car for me and I traveled through the country over some very rough roads. Near Leningrad, we had probably ten miles of new pavement—road construction is being pushed as fast as possible.

At the mill we were met at the front entrance by a guard—a woman with a gun over her shoulder who referred us to the gatekeeper, a bewhiskered Russian resembling those we see in caricatures. The manager sent down a representative and I was ushered into his office which was old in appearance but not unlike some I have seen over here. A grandfather clock stood in one corner and the walls were adorned with pictures of Lenin and other famous communists. The manager himself was a handsome man, clean shaven and dressed in Russian costume which consisted of the usual smock or shirt with a belt, riding breeches and high leather boots of good quality. The manager of production wore a good looking suit of clothes of western style and his assistant was a very intelligent looking woman.

After the usual exchange of courtesies through my interpreter, we went through the mill which was extremely dilapidated and badly in need of repair.

They seemed well aware of the poor condition of their equipment but were careful to point out that the reason for this was the great neglect it had suffered during the Czarist regime. They did not attempt to explain why so few efforts were being made to keep their mill clean and neat.

Most of their machinery and all three paper machines were of German manufacture. Some of their beaters were made in Scotland. On entering the machine room I noticed the machine tender at the wet end, seated in front of his machine enjoying a smoke. There was a break on the machine just then and after laying down his cigarette he assisted in putting matters right and returned to his chair to resume his smoke.

Their old style Hollander beaters had wide iron bedplates. A few, however, were equipped with sharp plates to run short free stock for absorbent papers.

The paper machines had approximately double the crew we have, half of them being girls. One was at the wet end to assist the machine tender, watching the guiding of wires and felts; another attending to the drying and a third at the reel.

None of these paper machines used a dandy roll. The kraft sheets naturally had a very wild formation in spite of the fact that their machine speed was less than half of what I would consider good operation.

In one instance I inquired as to the speed and was told it was 65 meters per minute. They could see I questioned this figure so they measured it with a surface tachometer and reported it as being 52 meters. I felt this was still on the high side and estimated the speed at approximately 45 meters (150 feet) per minute for a medium weight kraft. Their drying capacity was sufficient for higher production providing their machine would have held together.

The machine operators wore paper hats, manufactured by themselves from broke, in exactly the same fashion as is done over here. At noontime, I was invited to have lunch with several of the officials and eagerly took advantage of the opportunity to learn about their food and customs. We were taken to a room reserved for the executives where I sat down with them to an exceptionally fine meal. The oranges were large and there were also apples and pears. Cheese of several excellent varieties was served and there were several kinds of cold meat. I had previously found Russian tea to be of a most excellent quality. It was served with a slice of lemon. The dessert, however, was almost elaborate and consisted of several kinds of pastry of which I have never tasted better. The whole meal was of excellent quality and was an enjoyable experience.

After lunch, we visited the finishing room which was terribly overcrowded. Down the center was a narrow gauge track but the paper was piled so close to it that it seemed unbelievable a car could be run along the rails. The supercalenders were operating at a speed of about 300 ft. per min., and from the number of breaks it was evident that the waste must be excessive. A production schedule is made up at headquarters and I was shown figures for the previous week. The report showed that this mill had achieved 112 per cent of its allotted production. I felt their standard must have been extremely moderate.

This three-machine mill, without any pulp mill, had 600 employees and an additional 200 men on construction.

Specialty Mill Out-of-Date

The specialty mill I next visited was very interesting, their papers being of better quality in spite of the fact that they used no dandy rolls. They had three machines of 70- to 80-inch trim and one, I was told, was making cigarette paper. On examining the machine

I was puzzled when I noticed the layer of stock on the wire. At the dry end, the paper was obviously much thicker than what we would call cigarette tissue. Eventually I found that this paper was for the tube end as Russian cigarettes are made with a heavy tube of this paper and the balance is designed to hold the tobacco in very thin tissue.

The machinery in this mill was similar to that in the two mills previously described. The design was conventional and rather out-of-date and the whole mill was in a very poor state of repair. The finishing room was so disorganized that it was remarkable that paper could be put through it. I examined the method of sorting and found they were not taking out defective sheets as we would. They removed only the torn and broken sheets and those obviously unfit for use. In spite of this, their waste seemed to be exceptionally high.

After going through their finishing room it was closing time for the day and the workers gathered around a woman speaker who had come to explain the inauguration of the Stakhanovite system.

The Stakhanovite System Spreading Through Russia

Stakhanov was a Russian coal miner who by properly organizing his fellow workers and by means of better routing and the use of time-saving methods was able to increase coal production from about ten tons in a given unit time to 115 tons in the same period. For this, he was given a medal, representing the order of Lenin, one of the highest honors which can be bestowed. He was also presented with an automobile and given many privileges and is now an outstanding personage.

This improvement in manufacturing methods is now sweeping throughout Russia along lines similar to those pursued by Taylor and Galbraith in the United States. They are stimulating this idea by creating Stakhanovite medals which are presented to individuals who have done an outstanding service in increasing production in any industry. It was stated that in one factory of 600 employees, they were able to get along with 400 employees, the 200 workers being transferred to another industrial unit. This increase of production per employee automatically raises purchasing power throughout the country as workers are now able to earn considerably more than formerly and individual effort is being rewarded.

It is easy to see that in a paper mill manufacturing specialties tremendous improvements can and are taking place. This specialty mill of three paper machines without any pulp mill required 650 employees.

It is freely predicted that this Stakhanovite system will revolutionize Russian industry if properly applied. To make it attractive, the more skilled employees and the more industrious workers earn more money than their fellows and they are getting farther away from their original set-up where all workers were paid amounts very much the same.

As a matter of fact, many changes have taken place and are occurring today. There is plenty of evidence that Russia is gradually changing her methods of industrial operation toward mass production as it is in the United States, England and other so-called capitalist countries. Even in the matter of class distinction they are inevitably creating an upper class, and I think this must continue in spite of their efforts to stop it. I was told in Russia that class distinction had been done away with, but I could not agree with this and discussed the point with a very intelligent Russian. I claimed that their upper class now consists of the higher government officials who live in the Kremlin, who drive their Rolls-Royces and have numerous privileges. It seems human nature that the most able men in Russia will endeavor to live better than the masses and will continue to do so.

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Ten Pertinent Packing Pointers

W. F. Schaphorst, M.E.

THE following suggestions and warnings, based on the many years of practical experience of a prominent eastern packing manufacturer, will be found valuable in the installation of packings. To follow them may mean freedom from trouble that would occur when even the best packing is improperly installed.

1—Never fail to make clear what the packing is to pack. In other words, with what will the packing make contact?

2—Never guess at a size, diameter, width or height, when ordering packing. Many failures result from small errors in dimensions.

3—Never allow too little or too much clearance between follower plate and inside cup wall, or any metal parts behind any upright leather wall. $\frac{1}{16}$" to $\frac{3}{32}$" on each side, depending on size of packing, is recommended.

4—Never doctor packing lips with a pocket knife or file, or batter lip in installing. A rounded lip destroys the seal. Packings can be softened by soaking in warm water if necessary.

5—Never apply cup packings with flange too high for clearance at the head of the cylinder. Keep systems clean, so sediment will not collect in cylinders and wear the packing.

6—Never apply cup packings to end of plunger which is badly worn; pressure will force the packing down into clearance before plunger and cylinder. Leather washers cut from old cup packings can be made to reinforce the heel of cups on worn plungers.

7—Never apply "U" packings where plungers are worn without reinforcing under heel with leather cushion rings.

8—Never look for long service on scored plungers or in scored cylinders; resurface or reline such equipment to proper dimensions.

9—Never allow water to corrode cylinder walls, plungers or rods. Use an anti-rust agent that will prevent this and will act as a lubricant.

10—Never squeeze hemp or fabric filled "U" packings in glands where such packings are to replace solid section compression packings; set gland up to point where "U" packings are free to function properly.

Save-Alls in the Paper Mill

L. E. RANDECKER, Assistant Chief Engineer
Hammermill Paper Company

THE recovery of waste fiber has long been recognized as being fundamentally good practice. It was generally accepted by the paper mills but because of the inefficient types of equipment on the market the results were disappointing.

With the introduction of the vacuum filter, which incorporates the principle of filtering the waste white water through a mat of papermaking fibers, the stock is recovered with high efficiency and at such consistency that it can be readmitted immediately without degradation into the stock stream in process.

Also, the effluent leaving the save-all is sufficiently clarified so that it can be re-used generally as paper machine shower water.

Consequently, the vacuum filter has been quite generally installed.

However, in spite of its mechanical advantages, the successful application of such systems depends to a great extent upon operation.

The efficiency of a save-all is affected not only by the method of operation but by the mental attitude toward it of the mill superintendent and men. The results are greatly influenced by three factors that are not mechanical:

(1.) The enthusiasm of the superintendent's belief that the saving of fiber and water is a vital part of operating cost.

(2.) The effort expended by the management to instill this enthusiasm into the beater and machine room crews.

(3.) The intelligence and skill exercised in the manipulation of the system.

Naturally, a save-all to the paper mill crews, both beater and machine, is a nuisance, and rightly so. To counteract this, they must be sold immediately to the idea that the save-all in these days of stiff competition is just as essential to their job as orders. If this phase of the problem is controlled, a save-all has a very good chance to develop its potential efficiency.

In addition to the mental obstacles to be overcome, there are, of course, operating difficulties to be recognized.

The beater and machine crews will soon learn that when the recovered stock is returned to the machine chest the consistency in the chest and the resultant weight on the paper machine will be harder to control but, more serious and not easily correctible, the color will gradually change in the chest depending upon the proportion of recovered to beaten stock entering the chest. With some shades of paper because of the color differences this is so serious that they can not at any time be run on the save-all.

To give the beater men some chance to correct this color variation, the recovered stock in some instances is returned to the beater chest instead of to the machine chest. This, on the whole, is not an entirely satisfactory arrangement and probably can be improved upon.

Incidentally, by returning the recovered stock to the beater chest, the over-all efficiency of the save-all will be lowered because of the increased time lag between the paper machine and the beater room.

There is, however, one possibility to eliminate the disadvantage of color changes caused by the recovered fiber and sweetener. This is to use the differently colored recovered stock by blending it as a color corrective at a controlled consistency and volume with the beaten stock as it leaves the paper machine mixing box. The method and the machinery for doing this have recently been made the subject of a patent application. If this proves out as anticipated, a serious disadvantage of vacuum type save-alls could be turned to an advantage. A quick color correction could be made on the paper machine and the lag between the save-all and the paper machine eliminated entirely. This method, however, has yet to prove its commercial practicability.

To overcome the difficulty with color variation, one manufacturer advocates that the save-all be run with no fiber as a filter aid. This, while it might minimize the color problem, is not a practical solution for the recovery of stock and is wrong in principle. The high recoveries obtained from the vacuum type save-all are premised on the fact that the white water with its solids is filtered through a fiber mat that is formed by adding fiber from the regular stock flow. This added stock is called sweetener. The thickness of this filter mat, the relation of long fiber to short, the amount of filler in the white water, all are factors in recovery. In order to appreciate the effect of the amount of sweetener on recovery, data obtained from filter leaf tests is cited:

With white water containing 3 pounds per thousand gallons and with no sweetener added, the recovery was .25 pounds per thousand gallons and the loss 2.75 pounds.

When sweetener was added so that the water going to the save-all was increased to 6.5 pounds per thousand gallons, the recovery was 5.4 pounds per thousand gallons and the loss 1.1 pounds.

When sweetener was added so that the water going to the save-all had a fiber content of 13 pounds per thousand gallons, the recovery was 12.3 pounds and the loss 0.7 pounds.

When the sweetener was further increased to a total of 16.7 pounds, the recovery was 16.3 pounds and the loss 0.4 pounds. See Figure No. 1.

In another test in which an all-sulphite furnish contained 150 pounds of clay, the white water from the paper machine contained 16.7 pounds of solids. No sweetener was added to this and the recovery was 5.4 pounds per thousand gallons and the loss 11.3 pounds.

When sweetener was added so that the total solids going to the save-all was 24 pounds per thousand gallons, the recovery was 20.5 pounds and loss 3.5 pounds.

When additional sweetener was added so that the total going to the save-all was 32 pounds per thousand gallons, the recovery was 30.75 pounds and the loss 1.25 pounds.

Further sweetener was added so that the total going

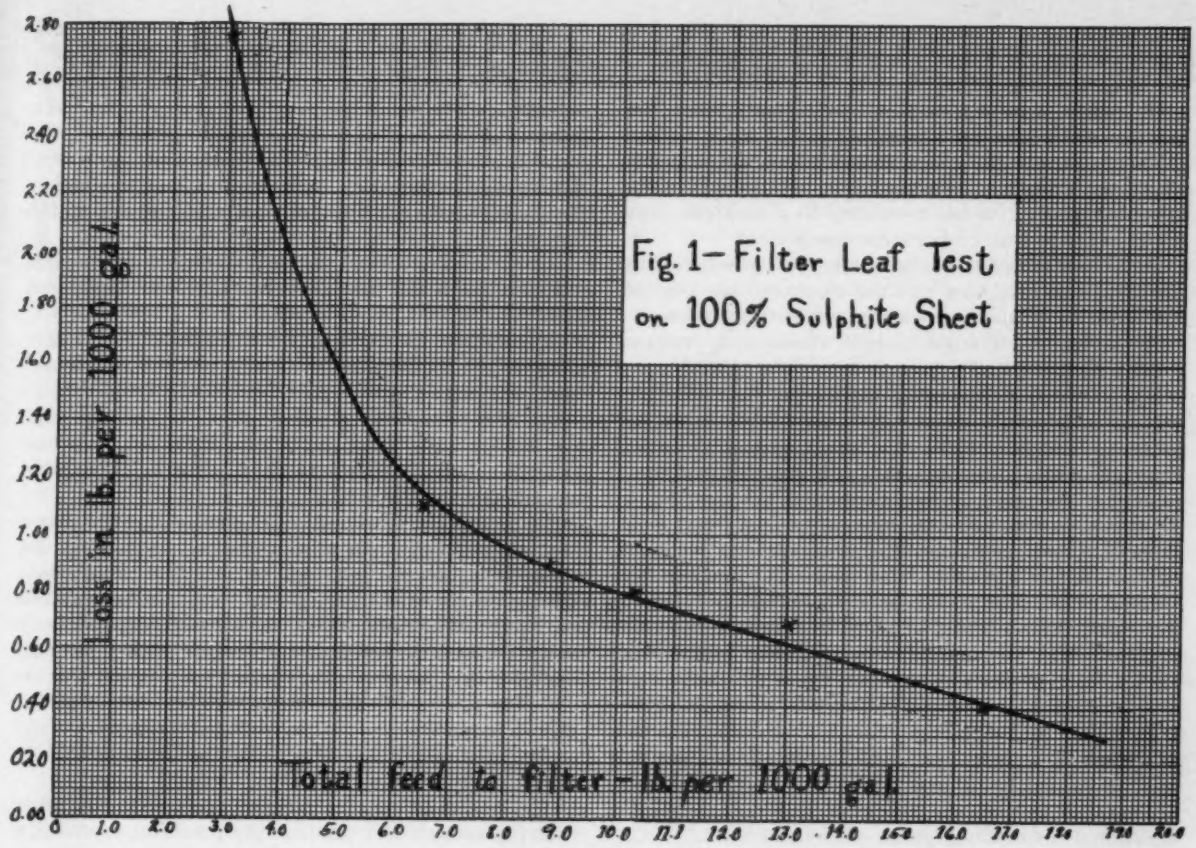

Fig. 1 – Filter Leaf Test on 100% Sulphite Sheet

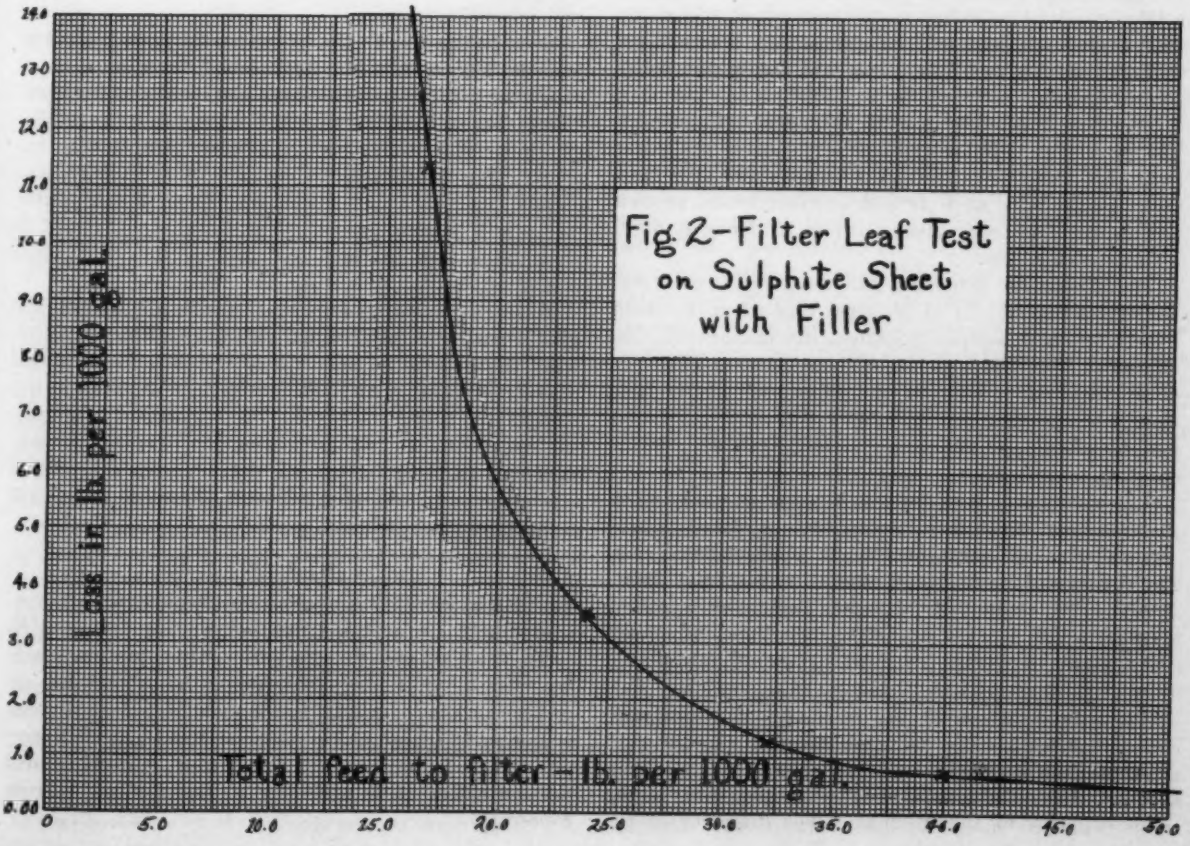

Fig. 2 – Filter Leaf Test on Sulphite Sheet with Filler

to the save-all was 40 pounds per thousand gallons in which the recovery was 39.25 pounds and the loss 0.75 pounds. See Figure No. 2.

Obviously, running without sweetener is not economical and makes for low recoveries.

There are advocates of a closed white water system who claim that an efficient save-all, with its contingent large investment, is not necessary to give high recoveries. This is true under some conditions:

In a news mill, for example, when the machine runs constantly on one color and the recovered stock is less valuable, an efficient save-all may not be necessary.

In a high grade sulphite mill where many runs of 5,000 pounds to 10,000 pounds are made annually and colors are run periodically each month or so, there will be many hours when water cannot be re-used for beater and jordan dilution. At such times the water must go to the sewer and if it contains 1.5 pounds of solids per thousand gallons instead of 0.5 pounds, the difference in recoveries mounts surprisingly fast. Besides this, there is a constant loss of water to the sewer because no mill making high grade papers can run without having some excess water. The problem of slime and the resulting build-up in slowness and color that occurs in a completely closed system would make such operation entirely impractical. The most optimistic superintendent would not hope to run with less than 25 per cent make-up. This constant flow of water to the sewer added to the times when the beaters and jordans cannot be diluted with white water soon accumulates an annual loss that will easily pay well the additional investment for an efficient save-all.

Then again, with an efficient machine the amount of solids at all times going to the sewer and eventually into a river or lake will be reduced to a minimum, thereby conforming to the purpose of our stream pollution legislation.

The design of the save-all cylinder is important. The deck should be accessible for cleaning, the water passages should be unrestricted, smooth and free from small projections, such as bolt or rivet heads, so that the channels will stay clean with no tendency to build up lumps of solids.

The doctor for removing the recovered sheet from the save-all should be so designed that when the sheet builds up to a desired thickness the doctor will discharge it from the cylinder without manual help. To obtain highest recoveries, the filter mat at no time should be less than $\frac{1}{16}$ inch thick and any doctor that can satisfactorily and automatically remove such a sheet is acceptable.

The capacity of a save-all on any one grade of stock is essentially controlled by two factors—the speed of the cylinder and the amount of submergence. The speed range of the cylinder should be carefully determined. The amount of water handled varies considerably in a mill making a variety of papers and to get the highest recoveries the cylinder should rotate at a minimum speed and at maximum submergence. This reduces to a minimum the sweetener requirements, which is always a desirable condition.

Arrangements should be made to bypass at all times through the cloudy port at least 25 per cent of the total capacity of the machine. The diameter of the barometric leg contributes considerably to the satisfactory operation of the save-all. If a large range of cylinder speed is required the velocity through the leg determines the minimum speed of the cylinder. The reason for this is that if the cylinder speed is reduced to take care of less water, the velocity drops through the leg until eventually, because of a lack of vacuum, the sheet breaks on the cylinder and falls back into the vat.

So, obviously, both from an installation and operating standpoint the save-all is not an elementary problem.

It is no easy matter to check the efficiency of a save-all system. Its earnings are made by squeezing a very small amount of solids—at times almost imperceptible—out of a very large quantity of water. These solids are mixed, while being recovered, with the stock used as a filter mat. They cannot readily be segregated, identified and measured.

The operation of the save-all creates another manufacturing hazard. It affects the consistency in the chest, it influences the color of the sheet and it may change the slowness of the stock. It is another variable which the beaterman must compensate for. There is every reason for the paper mill crews, if they see only the difficulty the save-all adds to their routine and are not educated to the benefits, to take the easy way out. The save-all will be run at reduced capacity, it will be attended to only casually, it will be shut down at the slightest provocation.

The best assurance that the management can be given that the save-all will produce the potential profits that are possible is to anticipate the effect of a save-all system on mill operation.

Even before the unit is installed, the superintendent and the key men in the mill should be told in detail the large savings possible and how these savings will affect the cost of operation. An operating routine should be established that gives close contact with the beater crew and machine crew. An intelligent and capable man should be in charge, directly responsible to the mill superintendent. The installation should be such that it will minimize the troubles the system must contribute to mill operation.

When these things are done, a save-all system will give a most excellent return on the investment; otherwise, the natural antagonism of the men to an added operating variable, an untelligent operator who can not co-operate, a bad installation that aggravates operating conditions, an indifference on the part of the management, all these factors will detract from a save-all's efficiency and gradually reduce a desirable asset into a disappointing liability.

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◆ FREQUENTLY the lowest-cost remedy for an overloaded belt is to install a new belt and pulleys of sufficient capacity and put the old equipment into stock. Sometimes conditions prevent doing this; then other expedients must be tried. If the smaller pulley is steel, changing to a high grade paper or wood type will give an increase in power up to 25 per cent. Covering steel pulleys with belting will have a similar effect. (From *Power.)*

Structure of the Middle Lamella

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IN AN earlier report, a method of isolating the middle lamella of wood by mechanical means in a virtually pure condition was described (2). A sample of this material was analyzed for lignin by a micro-method (3) developed for the purpose. Another sample was analyzed for pentosans by a specially devised micro-procedure (4). The material isolated contained 71 per cent lignin and 14 per cent pentosans, accompanied by 4 per cent of cellulose which should probably be regarded as the error in isolation. In spite of the above data on the composition of the middle lamella, no logical explanation was apparent for some of the effects of chemical digestion, as, for example, the stiffness of digested chips when dried in their intact condition after cooking, avoiding any macerating or disintegrating action. The logical attack to find the solution seemed to be a comparative study of wood anatomy prior and subsequent to digestion. Of particular interest at this point are earlier observations upon the effects of chemical digestion.

Evidence of Non-Ligneous Constituents

By means of chlorine-dioxide and sodium sulphite, Schmidt and his co-workers (14) removed only the lignin from wood, leaving the carbohydrate portion, which they designated *Skelettsubstanzen,* in its virtual entirety. Ritter and Kurth (12) also isolated the total carbohydrates (holocellulose) by treatment with chlorine, alcohol-pyridine solution, and calcium hypochlorite. A similar carbohydrate residue was later isolated by Hägglund and Sandelin by essentially the same process (7). In passing, it might be mentioned that pulping processes remove part of the lignin and most of the less resistant carbohydrates; subsequent bleaching leaves only the resistant carbohydrates. Ritter's investigations (10) first proved conclusively the presence of lignin in the secondary wall and what appeared to be an almost integral lignin content in the middle lamella. Harlow obtained similar results (8) while Searth *et al.* (13) and Abrams (1) studied the effects of various solvents and reagents. Recent researches by Kerr and I. W. Bailey (9) have contributed to our knowledge of fiber and middle lamella composition and structure.

Structure of the Middle Lamella

To attempt to explain, among other phenomena, the stiffness of dried digested chips, thin sections of wood were autoclaved at 95 deg. C. in various reagents and liquors of typical concentration used in commercial pulp production. Woods studied were heartwood specimens of Douglas fir *(Pseudotsuga taxifolia),* western hemlock *(Tsuga heterophylla),* Sitka spruce *(Picea sitchensis),* and black cottonwood *(Populus trichocarpa).* Digestion in 2 per cent hydrochloric acid darkened the wood and lightened the color of the middle lamella at the interstices of the cells while a frequent loosening of the lamella proper from the secondary wall was noted. Digestion in 12 per cent hydrochloric acid produced a frequent central cleavage in the middle lamella. Digestion by soda liquor affected the middle lamella chiefly, tending to cause its disappearance until the secondary walls of adjacent cells approached actual contact. The effects of sulphate digestion were similar except that in all four woods, a very conspicuous swelling of the secondary wall occurred. As only sulphate liquor induced this change, it is suggested that there might be a close relation between this swelling of colloidal fibers and the high strength of kraft paper. Sulphite digestion caused about the same effects as soda digestion, tending to remove the middle lamella. Of the three processes, however, the sulphate digestion approached more closely to complete removal of the middle lamella than did the others. Kerr and Bailey (9) also observed that delignification did not remove the lamella completely. It is perhaps significant that in no case did the above described digestion effect complete removal of the lamella, even after ten days digestion, although further study is necessary to determine if this effect obtains under the temperature conditions of actual practice in the industry.

Strictly speaking, it is difficult to draw a close analogy between the above experiments and commercial digestion since the former were aided by almost ideal contact with the cooking liquor with its resultant beneficial and accelerating effects, yet was handicapped by the low temperature at which the rate of some essential cooking reactions might be so low as to be negligible. Hence, the aggregate effects of the two types of digestion are not necessarily the same in kind. Digestion in acidified dioxane produced effects similar to sulphite digestion. Digestion in alcohol-pyridine solution, alternated with chlorination, produced effects which were less marked but similar to those produced by sulphite and dioxane digestion. In passing, it is interesting to note that soda and sulphate digestion produced exceedingly fragile sections—indicating more complete removal of the middle lamella—in all woods but the cottonwood; in sulphite digestion only the cottonwood sections were fragile. Since solution of the lamella is one of the putatively important objectives of digestion, it follows that another process is at work and that apparently, ease of disintegration and commercially successful pulping do not go together as would be supposed.

One striking observation in all digestions was so unusual and conspicuous as to demand considerable elaboration. Regardless of the method used to remove the lignin, the lamella in Douglas fir, in sharp contrast to the original wood, shown in Figure 1, took on a segmented appearance due to discontinuities in the lamella itself, as shown in Figure 2, as though the lamella were composed of longitudinal straps separating adjacent cells and with the straps laid not quite edge to edge, leaving a distinct gap when the less resistant interspersed material was removed. The

(*) At the time this article was written the author was associated with the University of Washington. He has since become affiliated with the Institute of Paper Chemistry, Appleton, Wisconsin.

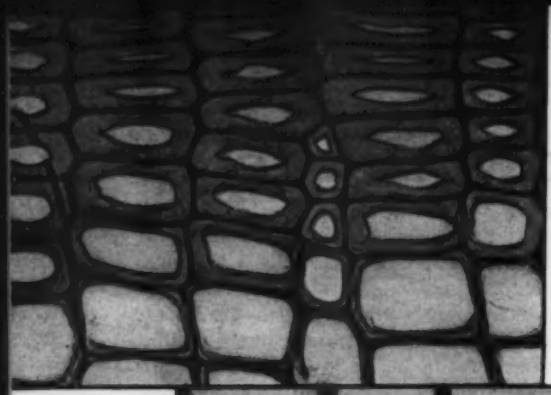

Figure 1—
Untreated Douglas fir, X 330
Section 6 μ thick

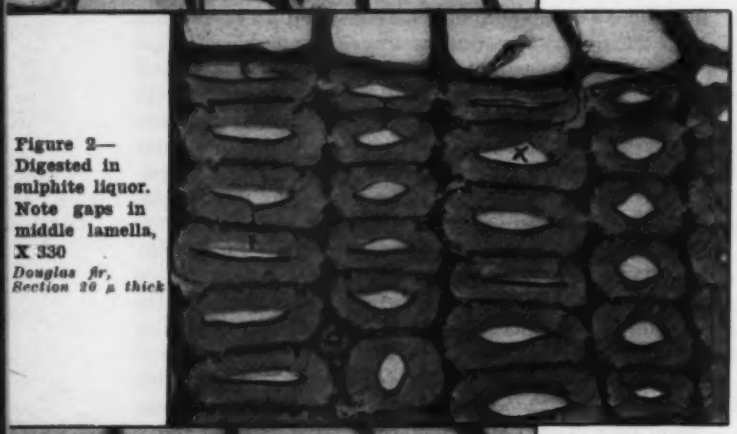

Figure 2—
Digested in sulphite liquor. Note gaps in middle lamella, X 330
Douglas fir, Section 20 μ thick

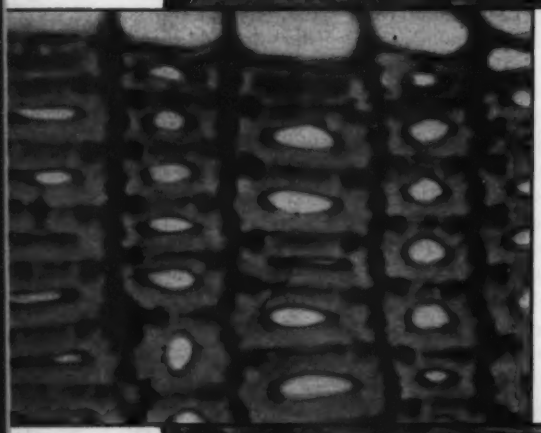

Figure 3—
Same as Fig. 2 except focus raised, showing shadows due to Becke effect
Douglas fir, Section 20 μ thick

Figure 4—
Cell marked by a cross in the lumen in Fig. 2 showing gaps in lamella, X 1150
Douglas fir, Section 20 μ thick

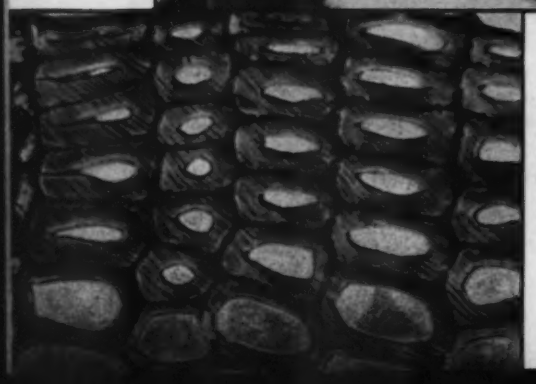

Figure 5—
Digested in acidified dioxane, showing gaps in lamella, X 330
Douglas fir, Section 20 μ thick

segments which remained were not removed by any of the pulping liquors and appeared to be completely insoluble in 72 per cent sulphuric acid, but were removed by oxidation with sodium hypochlorite. In contrast with other woods, instead of leaving behind an insoluble meshwork after 72 per cent sulphuric acid treatment, the lamella of Douglas fir summerwood fell apart with no indication of any structural connection between segments although, obviously, such drastic treatment would not be apt to detect such a union. Regardless of pre-treatment, the segmented lamella of Douglas fir was in sharp contrast to the other woods studied. The presence of the gaps between the segments was made more striking by raising the focus, Figure 3, so that the shadows—due to the bright Becke line moving into the medium of higher index of refraction—were emphasized. The gaps caused by the removal of the "mortar" between the segments are shown more clearly in Figure 4. Examination of sections digested in acidified dioxane exhibited the typical gaps, Figure 5, and the characteristic Becke shadows when the focus was raised, Figure 6.

In order to study this structural feature more fully, sections were subjected to mild oxidation by sodium hypochlorite; the resulting appearance of the same type of segmented lamella is shown in Figure 7 and the typical Becke effect upon raising the focus in Figure 8. More severe oxidation by the same reagent removed the lamella completely (Figure 9) leaving a number of hiatus on the periphery of the secondary wall. The hiatus are shown more clearly in Figure 10, which is a more highly magnified view of the cell indicated by a cross in Figure 9. All of the tissue shown in Figure 9 dissolves in 72 per cent sulphuric acid.

Discussion of Middle Lamella Structure

The impossibility of completely removing the middle lamella by delignification was noted by Kerr and Bailey (9) who suggested that some polyuronides and tannins which occurred in the middle lamella were left behind as a residue in the ordinary sulphuric acid method of isolating lignin. Dadswell (6) and Ritter and Barbour (11) substantiated the view that tannins are insoluble by demonstrating their interference in the estimation of lignin by sulphuric acid. Whether or not these observations apply to the insoluble segments material of the middle lamella of Douglas fir is not known. There appears to be a similarity between this segmented lamella and the spirally wound lignin sheath which Carpenter and Lewis found to be wrapped around fibers (5). In the case of Douglas fir the angle of the wrapping with the longitudinal axis of the fiber seemed to be very small. As was noted earlier (2), strap-like processes were observed attached adjacent to the secondary wall, while central cleavage of the middle lamella was noted during resection operations and by digestion in 12 per cent hydrochloric acid. In other words, under certain conditions the segments of lamella may be split, when they then have all the characteristics of Carpenter's and Lewis' spiral lamellar sheath. It is entirely possible that a segmented middle lamella and hiatus occur in many woods and that their prominence in Douglas fir constitutes an extreme case of overdevelopment. Just how this sheath would react toward polyuronide and tannin reagents

might form the basis for interesting and important experimental work.

As regards the occurrence of hiatus in the secondary wall, it is difficult to reconcile this unconformity with present knowledge regarding the lateral outer wrapping of fibrils around the fiber. It is interesting to note that after elucidation of the presence and characteristics of the hiatus, they can be detected in stained, but chemically untreated sections, thus precluding the possibility of the formation of the gaps by shrinkage of the lamella during digestion due to removal of some constituents, and subsequent formation of the hiatus due to more effective contact of, and solution by the digesting liquor. This conclusion is further substantiated by the appearance of hiatus in sulphite digestion as shown in Figure 2. Gaps in the lamella and hiatus were found only in the summer wood of Douglas fir. It is obvious that the composition of the segmented lamella isolated and analyzed (2, 4) does not necessarily correspond to the composition of the unsegmented lamella in the springwood. The function, significance, location, association, and cause of symmetry of the gaps in the lamella and the hiatus are obscure. So far as is known, no similar structural features have been demonstrated in cellulose fibers.

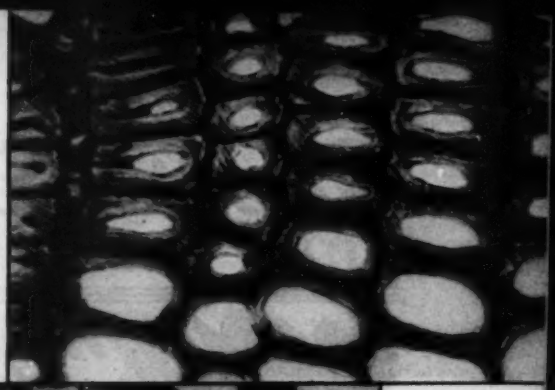

Figure 6— Same as Fig. 5 except focus raised, showing shadows due to Becke effect
Douglas fir, Section 20 μ thick

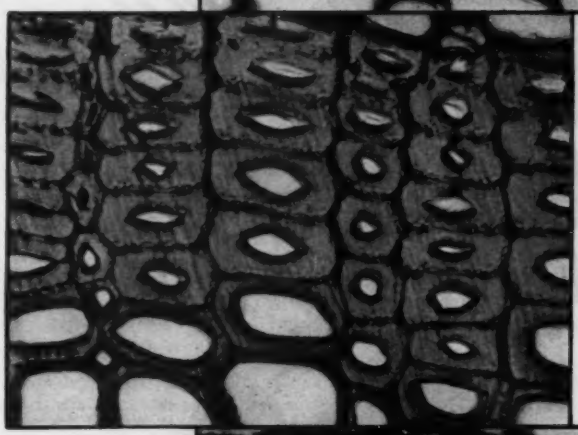

Figure 7— Effects of mild oxidation, showing gaps in middle lamella, X 330
Douglas fir, Section 20 μ thick

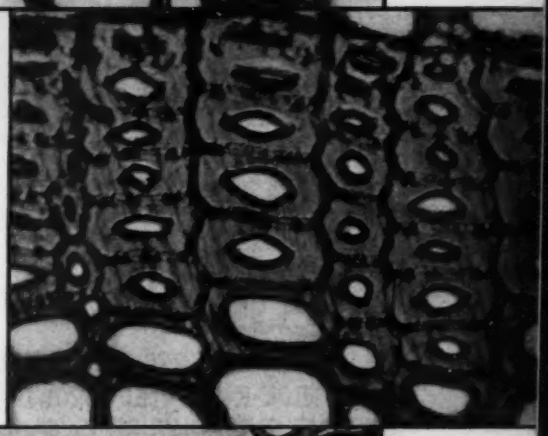

Figure 8— Same as Fig. 7 except focus raised showing shadows due to Becke effect
Douglas fir, Section 20 μ thick

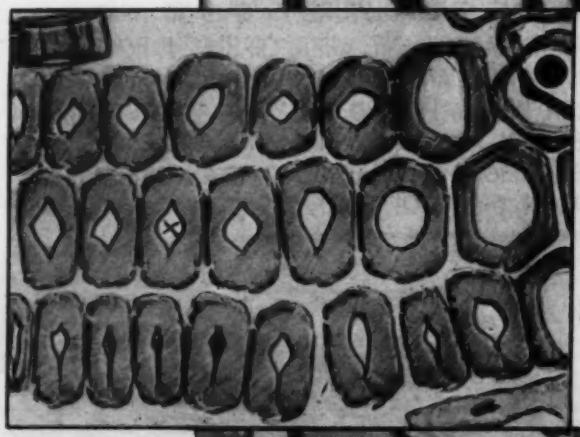

Figure 9— Effects of severe oxidation, showing absence of lamella and hiatus in the secondary wall, X 330
Douglas fir, Section 20 μ thick

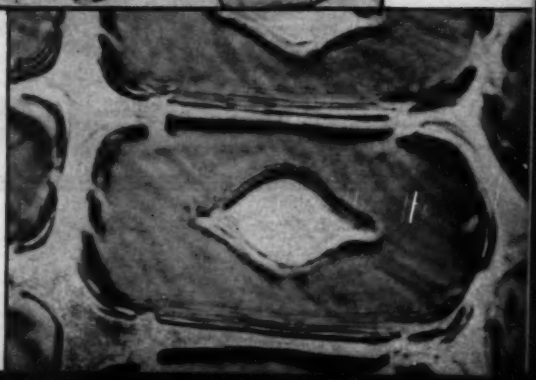

Figure 10— Cell marked by a cross in the lumen in Fig. 9, showing absence of lamella and hiatus in the secondary wall, X 1150
Douglas fir, Section 20 μ thick

Summary

The results of experimental work on the structure of the middle lamella and the effects of chemical digestion upon wood structure are reported. Digestion similar to commercial practice except for a lower temperature did not completely dissolve the middle lamella. Definite resistant segments in the lamella of Douglas fir were found which resisted solution by cooking liquors but which were dissolved by sodium hypochlorite. New morphological features, hiatus in the secondary wall of the summerwood tracheids of Douglas fir, accompanied by a segmented lamella—the ends of the lamellar segments coinciding with the hiatus—were discovered and studied.

Acknowledgment

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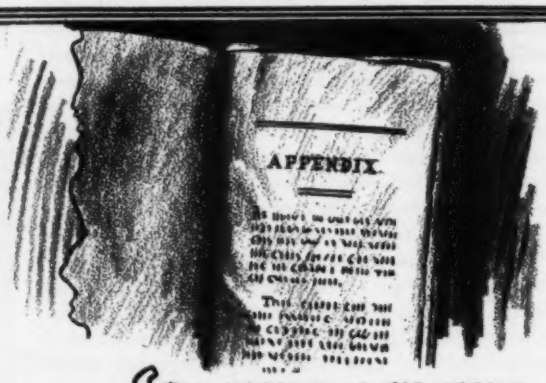
Paper Sketches---

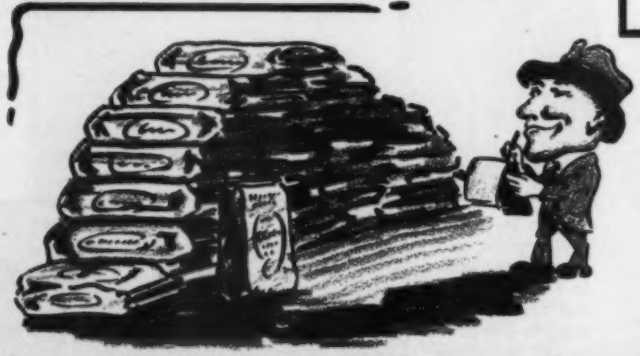
charles ECKART

THE FIRST USE OF MULCHING PAPER TO CONTROL RANK WEED GROWTH AND TO CONSERVE SOIL MOISTURE IS SAID TO HAVE TAKEN PLACE IN 1914, WHEN CHARLES F. ECKART, MANAGER OF AN UNIRRIGATED SUGAR PLANTATION IN HAWAII, LAID STRIPS OF ASPHALT PAPER BETWEEN ROWS OF SUGAR CANE. FROM THIS BEGINNING AND SUBSEQUENT RESEARCH HAS GROWN THE MULCH PAPER INDUSTRY OF TODAY.



STILL UNKNOWN IS THE METHOD EMPLOYED BY MATTHIAS KOOP TO PRODUCE THE PAPER MADE FROM WOOD WHICH HE USED IN 1800 IN THE PRINTING OF PART OF HIS FAMOUS MONOGRAPH.

SO INDISPENSABLE WAS PAPYRUS TO THE ANCIENT WORLD, THAT A FAILURE OF THE CROP DURING THE REIGN OF TIBERIUS THREATENED TO PARALYZE BUSINESS LIFE IN THE ROMAN EMPIRE.



IN 1935, ALMOST 350,000,000 HEAVY-DUTY, MULTI-WALLED PAPER BAGS WERE USED IN THE UNITED STATES AND CANADA TO TRANSPORT CEMENT, HYDRATED LIME, GYPSUM PLASTER, FERTILIZER, CALCIUM CHLORIDE, SODA ASH, AND A WIDE VARIETY OF OTHER PRODUCTS.

The Economy of High Intensity Mercury Lighting

WALTER W. WILDEMAN, Commercial Engineering Department
Westinghouse Lamp Company

IN every step of paper manufacture, from the storage of raw material to the shipping of the finished product, high intensity mercury vapor lamps can be used to great advantage by producing maximum intensities for improved seeing conditions, and consequent improvement of the manufactured product. Of high efficiency, and thus economical to operate, these newly developed lamps are ideal for the illumination of the large areas found in paper mills.

Though producing a light of similar color, the new lamp differs radically in design from the low intensity mercury lamp which has enjoyed some measure of success for industrial lighting during the past decade. Efficiency is much higher, however. The low intensity lamp, with accessories, consumes 450 watts and generates approximately 6,400 lumens, while the new 400-watt high intensity mercury lamp with accessories consumes 440 watts and generates some 16,000 lumens.

Aside from high operating efficiency, the new mercury vapor lamps possess certain advantages in color of light. In appearance the emitted light has a bluish-green color, but analytically, practically all the visible energy is concentrated in the blue, green, and yellow lines of the spectrum. With this quality of light, everything stands out quite clearly.

Although not exactly monochromatic, mercury lighting approaches this characteristic, aiding good vision. Producing illumination of three wave lengths of blue, green, and yellow predominating, mercury lighting thus contributes to the efficiency of human vision. (Figure 1).

(A) Since the major operations in paper mills are somewhat similar, whether for corrugated board or for writing paper, excellent lighting results can be obtained with high intensity mercury vapor lamps.

The type reflector chosen should be governed by the operations and ceiling height. If the mounting height is greater than 18 feet, the high bay reflector is recommended. If it is less than 18 feet, a diffusing reflector is more economical from an efficiency standpoint. The initial requisite is sufficient illumination. Operators can then work with safety and can immediately detect any foreign matter which may get into the pulp as it is agitated by the beater.

(B) For certain other operations,—the rollers, for example—a combination high intensity mercury light with tungsten filament lamp lighting will be found of greater benefit to quality production.

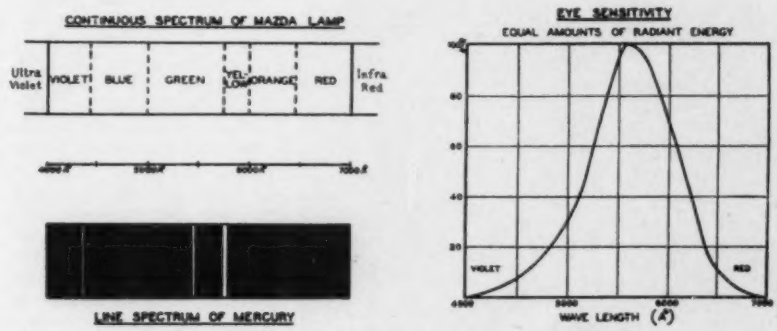


Fig. 1—In light of a multiplicity of wave length, as with the continuous spectrum of light from a tungsten filament lamp, the eye is continually trying to average a focus because its sensitivity varies for different wave lengths, thus undergoing a certain degree of eye fatigue. In mercury vapor light, the eye requires much less effort to average a focus because there are but three wave lengths. The eye is naturally more sensitive to yellow light in which it functions with less effort and greater clearness. The greater part of mercury light falls in the yellow portion of the spectrum, thus contributing to visual acuity and less eyestrain

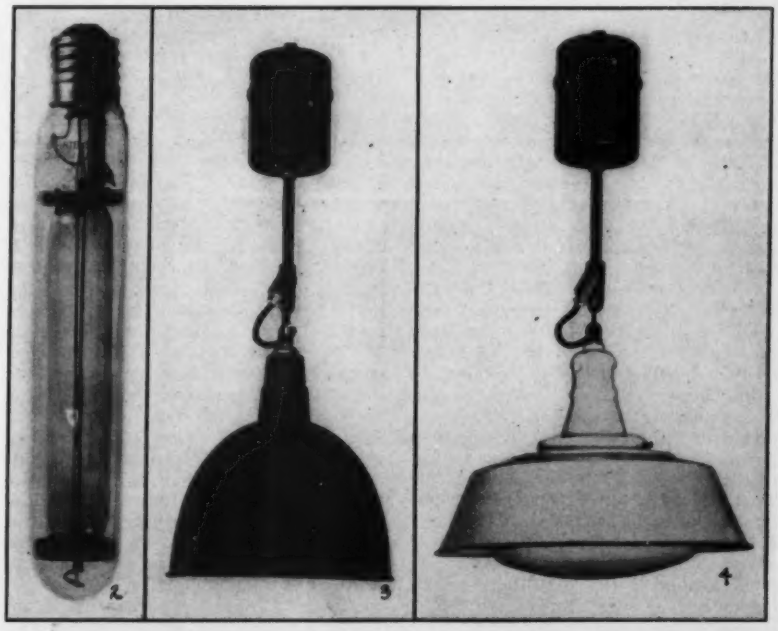


Fig. 2—The Westinghouse high intensity mercury vapor lamp consists of two tubular bulbs, one within the other like a vacuum bottle. When the lamp is operating, the inner tube is completely filled with a luminous gas which produces a brilliant light

Fig. 3—The High Bay type of reflector is recommended for use with high intensity mercury vapor lamps which must be mounted more than 18 feet above the floor

Fig. 4—If mounting height is less than 18 feet, the glassteel diffuser type of reflector is more desirable. Its enclosing globe of opal glass serves to diffuse the light and gives a softer illumination

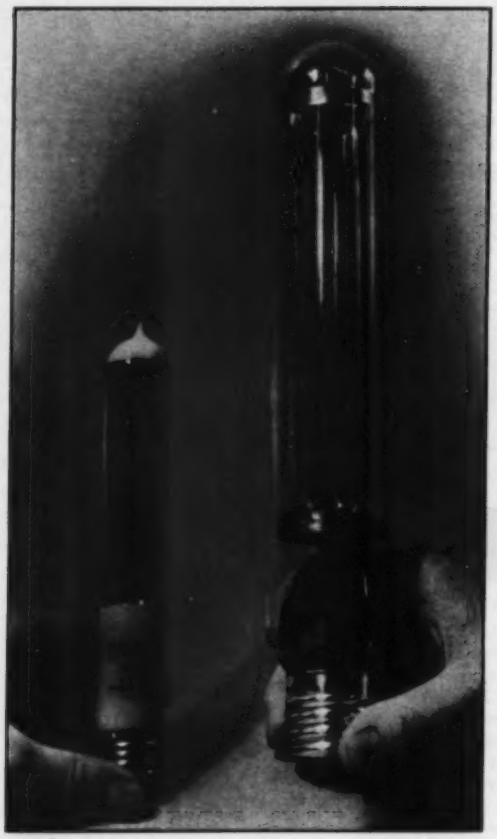


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Fig. 5—New 250-watt Westinghouse high intensity mercury vapor lamp (left) is about one-third the size of the present 400-watt design. It has efficiency of about 30 lumens per watt, produces 7500 lumens of light of distinctive color for an average life of 2000 hours, has a medium screw base, an overall length of 8 inches and can be burned in any position. Because of its single T-9, clear glass bulb, as contrasted to the double bulb of the 400-watt design, it is susceptible to drafts and must therefore be operated in enclosing units to assure maximum output of light

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In such an installation, the high intensity mercury units would be mounted directly above the rollers while angle-type units equipped with the tungsten filament lamps, would be directed onto the sides of the machine. In that way the paper passing over the rolls would receive high intensity mercury vapor lighting and the sides of the machine would receive lighting from the tungsten filament lamps.

This would be advisable because the flickering effect of the mercury lamps, though not apparent to the eye would produce an annoying stroboscopic effect with the moving ends of the rollers.

The high intensity mercury vapor lamp consists of two tubular bulbs—one within the other like a vacuum bottle—giving it a somewhat unusual appearance (Figure 2). The arc is formed in the inner bulb which is approximately 7 inches long and 1⅝ inches in diameter. When the lamp is operating, this tube is completely filled with luminous gas, thus making it the real light source.

An electrode of coiled tungsten wire is located at each end of this tube. Each coil is coated with a special mixture of barium compounds which serve to produce a copious supply of electrons when the lamp is in its initial stage of operation. An auxiliary "third electrode," located close to the regular electrode at the base end of the inner tube, facilitates positive starting in cold weather and reduces the time required for restarting, whenever the lamp may be extinguished by a service interruption.

A precise amount of mercury in the inner tube is completely vaporized by the electrical discharge and produces a pressure of about one atmosphere. Since the amount of mercury determines the operating voltage of the lamp, it must be critically exact. The inner tube also contains a small amount of pure argon gas which facilitates the establishment of the arc discharge when the lamp is turned on. The outer tube, enclosing the inner tube, serves as a heat insulating jacket to conserve the heat generated necessary to complete vaporization of the mercury. It also protects the inner supporting structure from damage.

High intensity mercury vapor light is not produced by an incandescent metal filament as is the case of a tungsten filament lamp. An arc discharge is the source of light. When first placed in operation, it fills the inner tube with a bluish glow of low intensity, then as the lamp warms up, the glow concentrates into a narrow pencil-like arc discharge of great brilliancy.

A few minutes are required after starting before the lamp comes up to normal operating condition. As it approaches this condition, the resultant light increases in intensity until stabilization is reached. Light output is then approximately 16,000 lumens. The lamp is designed for an average life of 2,000 hours.

Should the electric service be interrupted while the lamp is in operation, the arc will be extinguished and will not re-establish until the lamp has cooled sufficiently to reduce the mercury vapor pressure to a point where the original glow may again be produced. Cooling time will vary with the condition of operation. If the lamp is operating in an enclosing type of fixture, cooling time will be somewhat longer than in an open type fixture where air circulation is free.

A current limiting device, such as a transformer or reactor for each lamp, is necessary to the operation of high intensity mercury vapor lamps. Current limiting devices are often installed as part of the lighting fixture, or they may be placed at some distance from the lamp (Figures 3 and 4).

Although the 400-watt high intensity mercury vapor lamp has found wide acceptance in many industrial fields, there are many locations having ceiling heights of 12 ft. or less where this lamp should not be used because of its high surface brightness. As a result there has been a demand for a light source of similar type but of a lower wattage rating, especially suitable for low mounting heights. A recently developed 250 watt unit is expected to accelerate the use of mercury lighting in industry this year (Figure 5).

With a single clear glass bulb, as contrasted to the double bulb of the 400 watt design, the new lamp is a bit more susceptible to the cooling effects of circulating air. It should, therefore, be operated in enclosing units to protect it from any drafts and thus to assure maximum light output.

Having an over-all length of 8 inches and a medium screw base, the new lamp can be operated satisfactorily in existing fixture equipment if of the enclosed type. Since it can also be operated in any position, it is expected to contribute to a wider application of mercury lighting. Like the 400 watt lamp, the new 250 watt size is designed for operation on a.-c. only and then in conjunction with a current regulating transformer designed to meet the particular electrical values of the lamp.

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◆ British Foundrymen Learn American Practice

Speaking before the Institute of British Foundrymen, held in Glasgow, Scotland, June 9 to 12, H. H. Judson, Foundry Superintendent of Goulds Pumps, Inc., presented the American Exchange Paper entitled "The Founding of Pressure Castings" and dealing with the two cupola process. Writing with the usual British conservatism, the *Foundry Trade Journal* (London) declared Mr. Judson's contribution to be "of outstanding value," high praise indeed since it was the only paper mentioned in the review.

This is the second time within the year that Goulds foundrymen have materially aided the advancement of the art. At the annual meeting of the American Foundrymen's Association, M. T. Ganzange, Brass Foundry Superintendent, spoke on "The Production of Aluminum Bronze Castings to Withstand High Pressures."

Utility Carrier Economical in Plant Operation

FAST transportation of any bulk material about the plant, with practically no time out for loading and unloading, are advantages that are bringing into use a new method of transportation in a number of pulp and paper mills. The "straddle truck," as it is familiarly known, has been used for some time in the lumber industry of the Pacific Northwest. Now, under the more dignified name of the Utility Carrier, it is entering other fields.

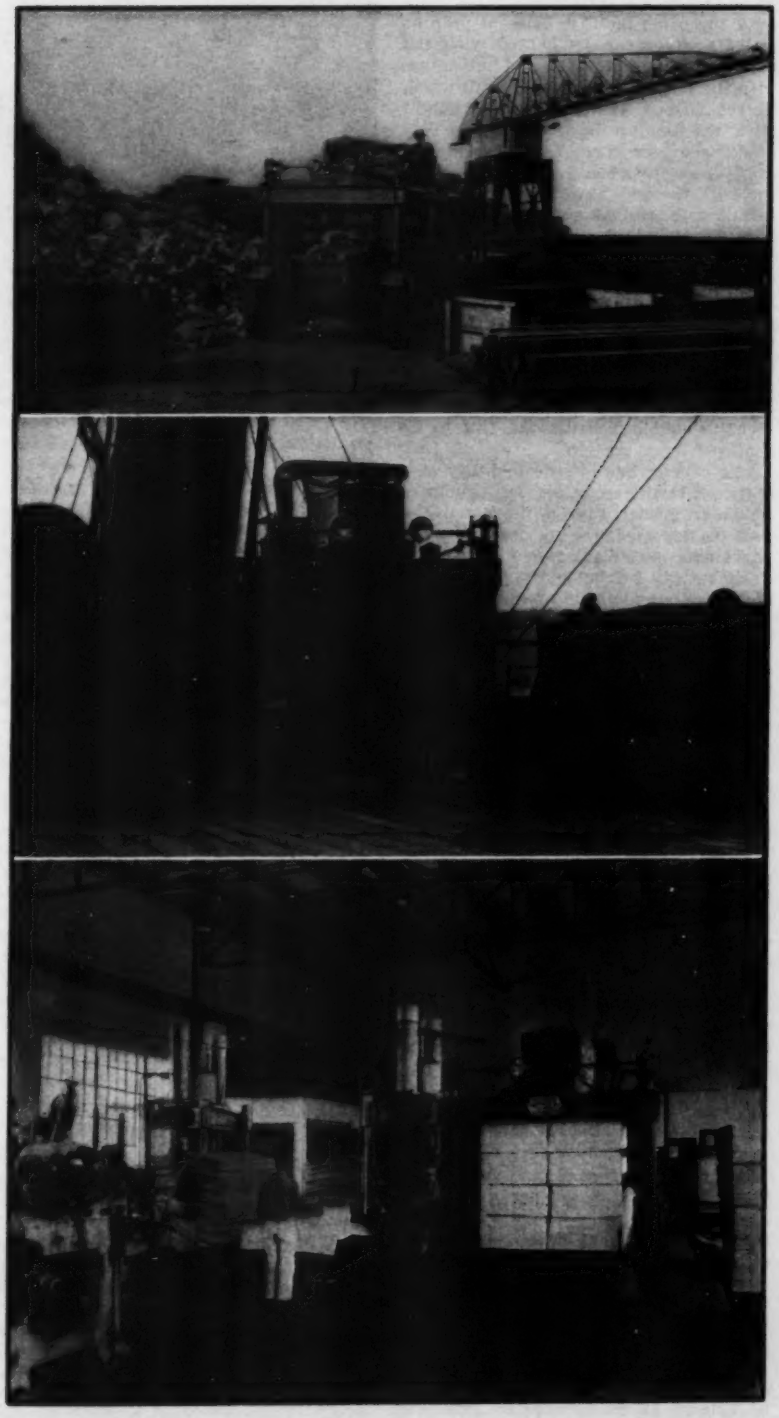
Without going into many technical construction details, it may be described as an elevated truck which straddles a load that has already been piled on cross-bars or bolsters a few inches off the ground. Two load carrying grapple bars, one on each side, then grip the ends of the bolsters, and by means of positive screw lifts they are raised until the load swings clear. The carrier then proceeds to the destination of the load, the hoists are reversed and the load deposited, when the carrier backs away. One man operates it, and it is seen that the carrier is both self-loading and self-unloading.

The wheels are located under the four corners, in forks which are provided with tubular spindles. These operate in cylindrical casings which are integral with the corners of the elevated frame. The weight of the frame and the power plant is carried on coiled springs located inside the spindles and on non-friction bearings. A chain drive on each rear wheel transmits the power from the engine.

All the modern automotive features are embodied: four-wheel hydraulic brakes; heavy-duty, six-cylinder engine, either gas or full Diesel; multiple disc type motor clutch; semi-floating truck type differential; high pressure Alemite greasing system, etc. In addition, it has a full-reversing transmission permitting three speeds forward and three backward, unique in the automotive field, as well as a four-wheel steering mechanism.

The carrier will make 50 miles an hour, if desired, and runs forward or backward with equal facility. Its turning radius is also very small, being only nine feet to center of inside wheels. It can, therefore, be manipulated in restricted quarters with greater facility than an ordinary truck.

In the handling of sulphur from the hold of a ship, for instance, the sulphur in 10 yard containers is laid down on the wharf by the ship's tackle, straddled by the carrier and hauled away to the main storage bins. It takes but a moment to pick up the load. To be exact, the speed of the hoist is one foot in two seconds. If the load is to be weighed, it is just as readily deposited on the scales and then picked up again. The carrier deposits the loaded bin above the elevator screen, picks up the empty bin and returns for another load. It



(1)—Utility Carrier picking up a loaded lime rock skip. (2)—Handling sulphur containers from wharf to bins. (3)—Handling paper pulp from baling press. Two skip loads, or 32 bales (14,400 lb.) to the load. No reloading between press and wharf or car platform.

need not be turned around, even, and it readily negotiates the ramp grades and turns sharp corners.

Handling lime rock in skips from platform or wharf to acid towers at the pulp plant is accomplished in the same manner. In the larger sizes of carrier, loads up to 15 tons are transported. Likewise with the same facility, bales of pulp as well as paper can be hauled with the minimum time in loading and unloading.

In the largest model, the overall width is 100 inches and the overall height with the top up is 134 inches. This model provides space for a load width of 64 inches and a load height of 66 inches. The weight of the carrier itself is 11,500 lb. and as stated it is capable of carrying a load up to 15 tons.

Heavy, pneumatic-tired truck wheels are used. Tire changing is easy as there is no jacking up to be done. The hoist screw on one side is simply reversed, the grapple bar forced against the ground, which lifts one side of the machine. It is not even necessary to drop the load. One side of the fork is detachable which permits the tire to be removed from the rim.

The carrier has all the mobility of a truck and will negotiate any kinds of roads or grades that a truck will, so that its use need not be confined to the pavements and runways of the plant itself but can be sent out with a load to any place outside of the plant.

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◆ Textbook Sales Hold Up Well

According to a report of R. S. Kellogg, Secretary of the Joint Textbook Committee of the Paper Industry, the McGraw-Hill Book Company reports sales of 222 volumes of the textbooks upon Pulp and Paper Manufacture during the first half of 1936.

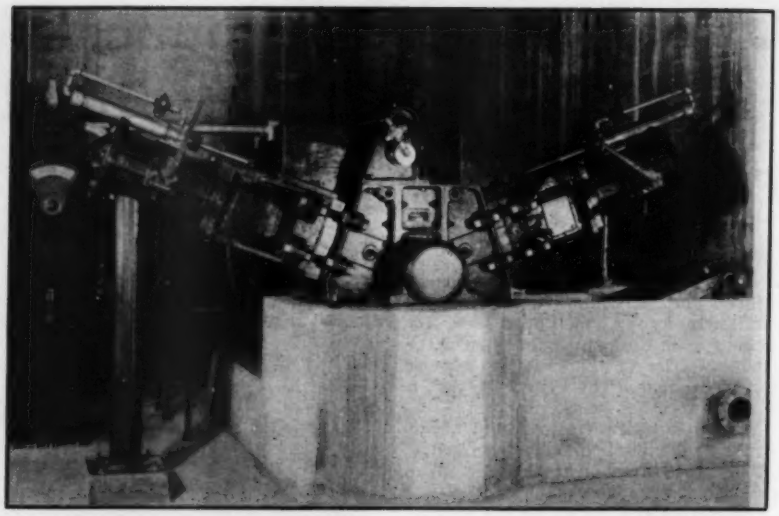
With Volume III out of print and under revision, sales of the other four volumes so far this year have totaled 218 copies, compared with sales of 327 copies of these volumes during the twelve months of 1935.

The manuscript and illustrations for an entirely revised Volume III, which deals comprehensively with the preparation and treatment of wood pulp, have gone to the printer. When the new edition is published it is expected that sales will increase materially in view of the sustained demand for this important volume in the textbook series.

A glance at the record shows that these textbooks, which are of fundamental importance to the pulp and paper industry throughout the world, first became available with the publication of Volume I in February, 1921, the original series being completed with the publication of Volume V in 1925. The total for the five volumes was nearly 2,800 pages.

The second edition of Volume III came out in March, 1927, the second edition of Volume IV in September, 1928, and of Volume V in April, 1929. Volumes I and II, which cover elementary subjects, do not need revision. Total sales of individual volumes to date exceed 25,000 copies.

Immediately after completion of the third edition of Volume III, corresponding revisions of Volumes IV and V will be pushed to completion as rapidly as possible under the direction of Editor Stephenson and with the assistance of many of the best known technical and operating men in the North American paper industry.



New Grinder Installed in Forestry College Laboratory

A NEW experimental grinder was recently installed in the Pulp and Paper Laboratory of the New York State College of Forestry, Syracuse, N. Y. This grinder is designed to take a stone 35 inches in diameter, with an 11-inch face, to grind wood 8 inches long. A modification of the two-pocket Great Northern design has been used, since it provides for great flexibility in operation and gives protection against splashing pulp when the grinder is operated at high speeds. Permission for the use of this design was extended through the courtesy of the holders of the patents on certain features of construction of the Great Northern grinder.

The drive for this grinder consists of a 250-h.p., direct current motor, the speed of which is variable between 300 and 900 r.p.m. This drive gives a very wide range of surface speeds at which the stone may be operated, yet with very little speed variation with changing loads. A motor-generator set has been installed to produce the direct current which is to be used in driving the grinder, and the necessary instruments have been included in the installation, so that very accurate determinations of the power consumption of the grinder may be made under any operating conditions.

Anti-friction bearings have been used on the grinder, to keep power losses to a minimum and render experimental data obtained from this grinder to be of a high degree of precision. As a special feature of design, the stone mounting has been so arranged that the stone can be taken off over the front bearing, without removing the bearing from the shaft. This provision enables stone changes to be made with little difficulty, and without disturbing the alignment of the shaft.

All electrical apparatus is to be protected from vapors resulting from the operation of the grinder by means of a wall between the grinder and the driving mechanism. The operating and controlling panels, together with the necessary instruments are to be visible from the grinder, but separated from it by means of a glass partition, so that there will be no danger from injury due to vapors or splashing from the grinder, yet all instruments will be visible during the operation of the grinder and all controls will be close to the operator.

A Norton artificial pulp stone, of the same specifications as those being generally used in the groundwood industry, is to be used in equipping this grinder.

The grinder was built by the Carthage Machine Works, of Carthage, New York.

◆ Accident Rates in the Paper Industry

The National Safety Council, 20 North Wacker Drive, Chicago, has published a booklet entitled "Accident Rates in the Paper and Pulp Industry, 1935." The data and statistics contained in this report cover the experience of 234 paper mills whose employees worked 162,310,000 man-hours.

Both accident frequency and accident severity rates in the paper and pulp industry were lowered during the year 1935 in comparison with rates in 1934.

From this report it is found that the paper and pulp industry ranks twentieth in frequency among a list of 30 major industries reporting to the Council; and in severity it stands twenty-fourth. The industry's frequency rate of 17.12 and severity rate of 1.94 are considerably higher than corresponding rates of 14.02 and 1.58 for all industries.

◆ American Forestry Ass'n Plans Annual Meeting

Seeking a better understanding of the part the science of forestry plays in flood prevention and control, the American Forestry Association, the oldest conservation organization in the country, will hold its 61st annual sessions at Eagles Mere, Pennsylvania, September 9, 10 and 11. The Pennsylvania Forestry Association, observing its fiftieth anniversary, will meet jointly with the national association in one of the most significant conservation conferences in years.

Sharing the stage with flood control at the sessions will be recreation, one of the most important subjects in forest and land utilization today. Secretary of Agriculture Henry A. Wallace, W. B. Rodgers, president of the United States Flood Control Federation, Senator Joseph F. Guffey, of Pennsylvania, Gifford Pinchot, former governor of Pennsylvania, and first chief forester of the United States, and other national authorities will participate in the joint conference.

The region in which the conference will be held is ideally suited for discussion and study of both flood control and recreation. Williamsport, on the Susquehanna River, where the foresters and conservationists will discuss flood control at a special luncheon, experienced what was probably the worst flood in its history this past spring, while North Mountain, just south of Eagles Mere, is one of the great forest recreation areas of the East.

Plans for the joint meeting call for a series of field trips interpolated with discussions and addresses by eminent authorities. The first session at Eagles Mere, on September 9, to be devoted to a general review of forest and land conditions in Pennsylvania, will be led by H. Gleason Mattoon, president of the Pennsylvania Forestry Association. The principal speakers will be Philip W. Ayres, formerly forester for the Society for the Protection of New Hampshire Forests, and now a director of the American Forestry Association, and George H. Wirt, chief forest fire warden of Pennsylvania.

The special flood control meeting at Williamsport on September 10 will be led by James G. K. McClure, of Asheville, North Carolina, president of the Farmers Federation, and a director of the American Forestry Association. The chief addresses will be made by President W. B. Rodgers, of the United States Flood Control Federation, and Senator Joseph F. Guffey.

Secretary Wallace will head the list of notable speakers addressing the conference on September 11, which also includes Dr. J. F. Bogardus, secretary of the Pennsylvania Department of Forests and Waters, and Francis R. Cope, Jr., an outstanding conservationist of Pennsylvania.

During the series of field inspection trips, which will take the foresters and conservationists into some of the principal forest areas in Pennsylvania, "World's End" and Ricketts Glen, on famous Kitchen Creek, will be visited. The American Forestry Banquet will be held at Eagles Mere on the evening of September 11.

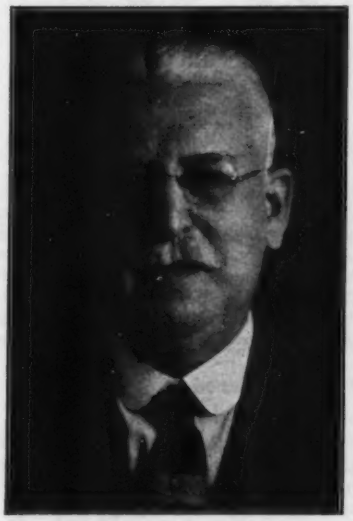
Organized in Chicago in 1875, the American Forestry Association has been a dominant influence in forest progress in America. Beginning with the creation of the National Forests in the early 90's, the educational and promotional work of the association has supported virtually every forward movement in the forest conservation field. Henry Solon Graves, who succeeded Gifford Pinchot as the first chief forester of the United States, and now dean of the Yale Forest School, is its president. Ovid Butler is executive secretary of the association.

◆ Charles Carroll Walden, Sr.

Charles Carroll Walden, Sr., for 52 years publisher of business papers for the paper and printing trades, passed away suddenly at his home in Ridgewood, N. J., July 14, at the age of 80 years.

Mr. Walden was president of Walden, Sons & Mott, Inc., New York, publishers of *Paper & Paper Products*, *Printing*, *Walden's A B C Guide for the Paper Industry* and *The Paper Catalog*.

Mr. Walden was born in Brooklyn, N. Y., of an old New England family. When 17 years of age, he obtained a



Charles Carroll Walden, Sr.

position with Howard Lockwood, then publisher of the *Paper Trade Journal*. His father was also associated with the organization. Later, he became identified with the advertising staff. In 1884, Mr. Walden and his father took offices and became publishers of the *United States Paper Maker*, which has since become *Paper & Paper Products*. Later they started the *New England Stationer* with offices in Springfield, Mass., and in 1886 published the first issue of *Walden's A B C Guide*.

In September 1919, the Walden Publishing Company joined forces with the Walden-Mott Company, publishers of *Printing* and *The Paper Catalog*, and the firm became Walden, Sons & Mott, Inc.

Surviving Mr. Walden are two daughters and four sons. Mrs. Walden passed away in March, 1931.

◆ M. L. Kemp Joins Hurlbut Paper Company

The Hurlbut Paper Company, South Lee, Mass., recently announced that Melvin L. Kemp has become connected with the organization as superintendent.

Mr. Kemp leaves a connection of twenty-one years with the Strathmore Paper Company, ten years of which he served as Superintendent of the No. 1 Woronoco Mill and eleven years as Technical Adviser for all the Strathmore divisions. Prior to that, he was connected with the L. L. Brown Paper Company and the American Writing Paper Company.

◆ H. T. Smith Marks 50 Years with Worthington

An unusual record is that of Harry T. Smith, traffic manager of Worthington Pump and Machinery Corporation, Harrison, N. J. Mr. Smith has just celebrated the anniversary of fifty years of continuous service with the Worthington organization. At the time of his connection with Worthington, he started with the old Henry R. Worthington Hydraulic Works, then situated in Brooklyn.

A testimonial luncheon was given for Mr. Smith on July 8 at the Newark Athletic Club, Newark.

◆ New Paper Companies Organized in Australia

Two new companies have just been organized in Australia to manufacture paper. One, under the title of Associated Pulp and Paper Mills Limited, proposes to establish a plant at Burnie, Tasmania, capable of an annual production of 15,000 tons of fine printing, writing, and typewriting papers. The company will utilize Tasmanian hardwoods in the manufacture of its pulp. It is reported that plans for machinery and the layout of the mill are in course of preparation in England, and that construction of the plant will be started before the end of 1936.

The other company, under the title of the British-Australian Pulp and Paper Company, plans to operate as a holding group and to finance mills for the manufacture of pulp from kurukuru grasses of New Guinea, which will be exported to Australia and other countries. The plans also include the manufacture of fine printing and writing papers, utilizing the pulp manufactured from these grasses. It is reported that as the result of two years' research work it has been proved that pulp suitable for the manufacture of papers similar to esparto can be manufactured. (Assistant Trade Commissioner Wilson C. Flake, Sydney.)

◆ Centrifugal Pumps for General Service

Fifteen sizes of compact, motor driven centrifugal pumps have been added to the extensive line of Goulds Pumps, Inc., Seneca Falls, N. Y. These pumps, featuring small size, low weight and high efficiency, have impellers of the enclosed

single suction type, shafts which are oversized and run in heavy duty ball bearings, and casings, equipped with priming, and drain openings as well as air vent cocks, that may be swiveled to any of four positions. Capacities for the pumps, which are known as Goulds Figure 3620, range from 5 to 1600 g.p.m.

◆ Automatic Pressure Compensator

The Foxboro Company, Foxboro, Mass., has developed an automatic pressure compensator for use with Foxboro flow meters in measuring the flows of compressible materials such as steam, air and gas. This compensator, which is in the form of a simple spiral pressure tube connected to a lever, corrects the position of the flow pen for a change in pressure as small as one-tenth of one per cent.

At zero flow, pressure changes do not affect the position of the flow pen. At all other points on the chart, the shift

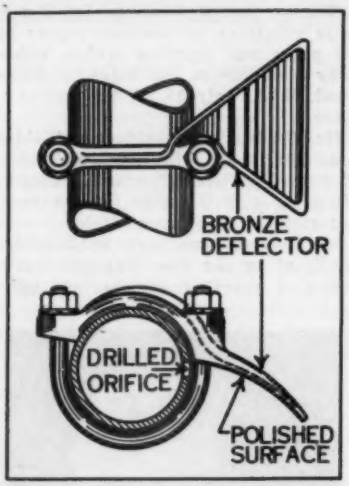
in pen position is just sufficient to compensate for the effect of this factor in the flow formula. On square-root flow scale meters, the pen position is varied proportionately to the change in absolute pressure. On uniform flow scale meters, pen position is varied proportionately to the square root of change in absolute pressure.

Should maximum flow and maximum pressure occur simultaneously, the pen will not travel beyond the upper chart limit.

By attaching one screw on the compensator to the mounting post in the instrument, the compensator becomes inoperative and the differential calibration is that of a non-compensating meter.

◆ Non-Clogging Spray Nozzle

Announcement is made by Link-Belt Company, Chicago, that it has developed a simple, effective, non-clogging spray nozzle for spraying, washing and cleaning of all kinds of materials. The nozzle consists of a smoothly polished curved bronze deflector and a U-bolt for clamping it securely to spray pipe in such a position that the deflector is just above



the orifice in the wall of the pipe. The width of the deflector permits a comparatively large jet to be used so that fairly large particles of dirt might pass through an orifice without clogging it. This nozzle is made in two standard sizes—one for assembly on 1½-inch pipe and the other for 2½-inch diameter pipe.

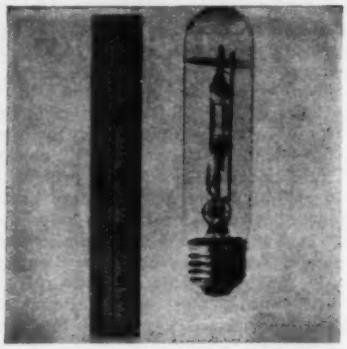
◆ Spur-Geared Hand-Chain Hoist

The Conco Engineering Works, 892 Jefferson St., Mendota, Ill., is introducing a line of precision, ball-bearing equipped, spur-geared, hand-chain hoists in capacities from ¼ ton to 6 tons.

Special effort has been made to make the line foolproof. A safety load chain keeps the chain from riding out of the pocket or fouling, or leaving the wheel no matter from what angle the hand chain is pulled. The chain is electrically welded. Hooks are of the safety type, and will open gradually under excessive load, thus allowing time to lower before opening. As an added safety factor, all parts of the hoist in suspension are made of steel.

◆ Small Size Bulb-Type Mercury Lamp

A new, 85-watt mercury lamp having a light output of 3,000 lumens and an unusually high unit brightness has been introduced by the General Electric Vapor Lamp Co., Hoboken, N. J. The actual light source of the lamp is a minute column of mercury vapor, less than an inch long, raised to an excep-



tionally high brightness within a sealed quartz tube. This quartz tube is mounted within a standard T-10 bulb (5½ inches long and 1¼ inches in diameter) equipped with a standard screw base.

Light from the new lamp possesses color characteristics generally similar to other mercury lamps. Although there is somewhat more red radiation present, the light is predominantly bluish in color quality.

In common with other vapor lamps, the new bulb operates through a ballasting type of transformer on standard alternating current circuits.

◆ Boiler Scale Remover

A boiler scale remover and eliminator, known as ELEK-TROL-IK, has been announced by Oneida Electric Mfg. Co., Green Bay, Wis. This device is stated to create an electrolytic action within

the boiler and that this action destroys all boiler scale without damage to boiler plates or tubes. One unit is recommended for use in boilers up to 100 hp. Boilers above 100 hp. require more than one. Installation is said to be easy and the claim of saving fuel is made for it.

◆ Anti-Frictional Plastic Packing

The Crane Packing Company, 1815 B Cuyler Ave., Chicago, has announced the development of an anti-frictional, dry-graphite lubricated plastic packing. This packing, known as "Super-Seal," is composed basically of extremely fine particles of a new anti-frictional alloy and asbestos fiber—the alloy and the fiber

being covered and saturated with a special high temperature binder that contains flake graphite. It is put up in six convenient forms; namely, valve stem (round), spiral (rectangular), coil (square), ring (split), production sets (endless), and bulk. Valve stem (round) comes in 3/16 in., 1¼ in., and 5/16 in. sizes; while the spiral form (rectangular) is furnished in steps of 1/16 in. from ¼ in. to 1¼ in. inclusive and the coil form (square) in eleven sizes from ⅜ in. to 1 in. It is claimed that this packing is resilient; that it never gets hard; that it does not dry out; and that it flows readily under gland pressure.

◆ Barrel or Drum Drain Rack

A steel rack that permits one man to place a barrel or drum 24 inches above the floor for draining purposes has been announced by the Barrett-Cravens Co., 3255 West 30th Street, Chicago. This rack, intended for either 500 or 750

pound containers, is available with or without casters. In the design of the rack is incorporated a rocker arc and an automatic floor lock. The rocker arc makes it easy to raise the barrel or drum, and the floor lock locks the rack in draining position as soon as container is tilted to right position. This position tilts the container slightly toward the bung or spigot end so it may be drained completely.

◆ Bottle Type Oil Feed Control

The Trico Fuse Mfg. Co., 2948 North 5th Street, Milwaukee, Wis., has announced a new feed control for its Drip-Drop oiler for solid, wick and waste-packed bearings. This control, through

a simple adjustment, causes the oiler to feed slowly, medium, or fast as the bearing may require. It is said to be designed to fit 95 per cent of installations without drilling or tapping.

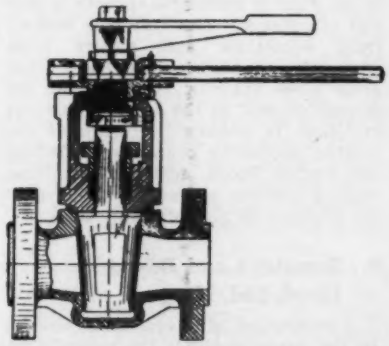
◆ New Type Direct-Fired Kettle

A new type of direct-fired kettle, built in stainless steel, aluminum or alloys, is the latest addition to the line of direct-fired, indirect-heated or electrically-heated kettles manufactured by The Patterson Foundry & Machine Company, East Liverpool, Ohio. It is de-

signed for internal vacuum and is equipped with removable dished bottom, special type cone overflow and inlet valves, siphon discharge, vacuum tight manhole and other features. The unit is agitated by a Unipower agitator of the gearless reduction type, and is furnished with paddle type or specially designed turbine type stirrers.

◆ Two-Handle Lift-Type Plug Valve

Homestead Valve Mfg. Co., Coraopolis, Pa., has announced a valve in which positive mechanical seating and unseating are incorporated in its design. This valve, known as a two-handle lift-type plug valve, has been designed to over-



come operating obstacles encountered with high temperatures, high pressures, infrequent operations, corrosion, etc.

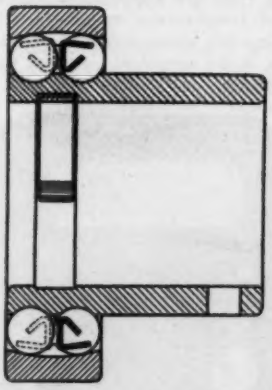
To operate this valve from a closed position, the plug is first raised only slightly from its seat by means of a handle which is fitted and fastened into a lifting mechanism—the plug being direct connected to this lifting arrangement. By turning the handle approximately one-quarter turn counter-clockwise, a positive upward movement to a predetermined point is produced. In this position, free rotary movement of the plug is assured. The plug is then turned 90 deg. into position by its own handle.

Reseating is accomplished by turning the lifting feature clockwise.

Pressure range for the valve is from 125 lb. upward, and the temperature range up to and including 750 deg. Fahr. Iron construction is used for pressures up to 250 lb., and bronze or cast steel with alloy trim best suited for service required for higher pressures.

◆ Grip-Lock Bearing

An anti-friction bearing that is easy to install without tools of any kind and that is locked to the shaft has been announced by S K F Industries, Inc., Philadelphia, Pa. This bearing, designated as Grip-Lock, is the conventional S K F self-aligning extended inner race bearing with an eccentric groove machined in the bore of the inner race. Fitted in the eccentric groove is a piece of spring steel known as the grip-lock



shoe. When the shoe is in the deepest part of the eccentric groove, the bearing may be readily slipped on the shaft. Then, by holding the inner race of the bearing, while the shaft turns in the direction of operation, the knurling at the ends of the grip-lock shoe grips the shaft and causes the shoe to wedge in the shallow part of the eccentric groove, thus locking the bearing on the shaft.

◆ Water Hose for Paper Mill Service

A water hose designed especially for paper mill service has been introduced by The B. F. Goodrich Company, Akron, Ohio. This hose, known as Type 1788, has a tube that is unaffected by hot water and a cover that will not blister or peel even though constantly wet. Likewise, it is stated that neither tube nor cover will shred or disintegrate. The tube is compounded to withstand the action of hot water without swelling; while the cover, which is thoroughly bonded to the carcass, is a tough, floating stock of triple thickness with a maximum resistance to abrasion. The thickness of the hose wall, it is claimed, makes it difficult to injure the hose even under abusive treatment. Wash up and

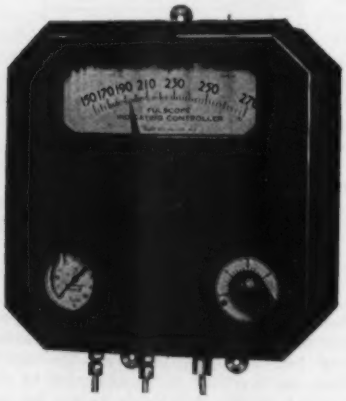
blow pit service are two applications for which the hose is said to be particularly adapted.

◆ Stationary Compressor

The Sullivan Machinery Company, Michigan City, Ind., has announced a new stationary heavy duty air and gas compressor of the single stage, single cylinder, double acting horizontal type. This compressor is built in sizes from 10 to 50 hp. and for pressures from 5 to 150 lb. Timken double row main bearings, replaceable cylinder liner and crosshead guide, tinned piston and crosshead, and streamline valve are the features of its design which are stressed; while long life, low power cost and fully automatic operation are the advantages claimed for it.

◆ Air-Operated Indicating Controller

Taylor Instrument Companies, Rochester, N. Y., have placed on the market an air-operated controller of the indicating type for application where control of temperature or pressure is imperative but where a record of the processing is not essential. Among the out-



standing features of the controller are: either high-range or full-range sensitivity as required; adjustable control point; quickly reversible controller action; large scale with bold numerals and graduations; and cast-aluminum case in both face and flush mounting styles. In addition, the controller includes many standard control ranges from which to choose—ranges from within the limits of minus 100 and plus 1200 deg. Fahr., or full vacuum and 3000 lb. pressure; and mercury, vapor, or gas-actuated tube systems for temperature units.

◆ Bearings Packed With Stability-Tested Grease

The Norma-Hoffmann Bearings Corporation, Stamford, Conn., has announced that all of its wholly-enclosed, sealed Precision bearings are now being packed with a grease that is pre-tested for maximum stability and that these bearings are wrapped in aluminum foil as a precaution against oxidation. This method of testing greases and packaging of bearings is said to be the result of long investigation by the company's research department to overcome the difficulties resulting from premature oxidation and hardening of ordinary greases.

◆ L. W. Grothaus Made Vice President of Allis-Chalmers

Announcement is made by the Allis-Chalmers Mfg. Company, Milwaukee, Wis., that L. W. Grothaus has been elected vice president of the company.

Mr. Grouthaus has been connected with the Allis-Chalmers organization for 32 years, having worked up through the shops, the purchasing, drafting, engineering divisions, then becoming district sales manager of the Minneapolis and Cleveland offices. Later promotions brought him up to be assistant to the president, which position he has held since 1933.

◆ "Hodell" New Name for Chain Products

The name of The Chain Products Company, Cleveland, has been changed to The Hodell Chain Company in order to closer associate the corporate title with the company products which are branded "Hodell Chains."

This change will in no way affect the product, personnel, officers or policy of the company. The company is now enjoying its 50th anniversary.

◆ Leipzig Fair Dates Announced

The 1976th session of the Leipzig Trade Fair will be held from August 30th to September 3rd, inclusive. Business men from all parts of the world have found it profitable to attend the fairs for more than 700 years.

Indications of world wide business recovery are found in the rapid growth of the Fair in recent years, both in size and attendance. The Fall Fair will attract exhibitors and buyers from seventy-four countries and will comprise 6,000 exhibits, rendering it the largest as well as the oldest industrial exchange in history. A score of the leading producing countries, including the United States, will send exhibits, making possible a preview of the newest products in all industrial fields.

◆ Bowater's and Edward Lloyd, Ltd. Merge

A transaction of international interest in the paper world is the recently announced merger of Bowater's Paper Mills, Ltd., and Edward Lloyd, Ltd., both large and well known newsprint manufacturers in England. Full details are published in the July 17 issue of *The World's Paper Trade Review.*

It will be remembered that the largest paper machine yet to be built was recently installed in the Kemsley mill of Edward Lloyd, Ltd. This machine makes a sheet 320 inches wide.

The deal, which involves a sum of about £4,000,000, has been arranged by the purchase of Bowater's Paper Mills from Allied Newspapers of that company's entire holding, amounting to 80 per cent of the ordinary share capital of £1,000,000 of the Edward Lloyd Investment Company, which in turn owns the whole of the ordinary capital of Edward Lloyd, Ltd.

◆ F. R. Sisson

Frederick Reynolds Sisson, assistant treasurer and director of the Racquette River Paper Company, Potsdam, N. Y., passed away suddenly July 7 at the age of 65 years.

Mr. Sisson was born in Potsdam and received his early education in the schools there. He became associated with the Racquette River Paper Company early in his business career and spent most of his life in its activities. During the past year he had been in charge of the pulp mill and other outside work and had also managed the real estate division of the company.

Mr. Sisson is survived by his widow, a daughter and a son.

◆ T. A. Cook to Manage New Charleston Plant

Announcement has been made by the West Virginia Pulp and Paper Company that T. A. Cook, who has been pulp mill superintendent of the company's plant at Tyrone, Pa., has been appointed manager of the new plant now in course of erection at Charleston, S. C. Mr. Cook will take up his duties in Charleston about September 1.

H. C. Fernau, Mr. Cook's former assistant, will succeed him at the Tyrone plant.

◆ ROOTS-CONNERSVILLE BLOWER CORP., Connersville, Ind., announces that the vacuum pumps for suction rolls, flat boxes and felt conditioners at the new plant of the Union Bag & Paper Co., Savannah, Ga., are of the rotary cycloidal type, manufactured by that company. Seven pumps will be used in all: five 12 x 18 in. and two 10 x 15 in.

◆ Glycerine for Clean Hands

Thousands of employees know the difficult problem of getting their hands clean at the end of the day. To remove dirt grimed into the skin, the drastic methods necessary for adequate cleansing sometimes leave the hands painfully dry and sensitive and proportionately more difficult to clean the following night.

The National Metal Trades Association meets the problem with glycerine, according to John J. Lamb, office manager, who reports that glycerine is furnished regularly for employees who work on certain hand-grinding or hand-lapping operations.

"As the employees' hands become very much begrimed from their operations," said Mr. Lamb, "they wash them in cleansing liquid which also dissolves much of the natural oils in the skin. To

counteract this, glycerine used freely, and although various hand lotions help, there is nothing that seems to restore the healthy condition of the skin as pure glycerine does."

◆ Westinghouse Appoints McElhone to New Post

H. C. McElhone, who has served in various capacities in the works, headquarters sales, stock control and executive department, has been appointed assistant to vice president of the Westinghouse Electric and Manufacturing Company.

Associated with Westinghouse since 1919, Mr. McElhone for the past five years has been attached to the president's office. In recent months he has been in charge of Westinghouse Golden Jubilee Year activities.

◆ Fibre-Making Reports Sales

Fibre-Making Processes, Inc., Chicago, reports the recent sale of the following: 4- 12 x 45 ft. barking drums; 1- 12 x 22½ ft. Washing Drum; 6 F.M.P. Circulating & Indirect Heating Systems; 1- F.M.P. Circulating System; as well as 1 Nekoosa Chip Cutter and 2 F.M.P. Coarse Screens.

◆ Cellulose Sponge

A cellulose sponge that can be used for all purposes to which sponges are usually put and in virtually every respect, and that will give superior service, is announced by du Pont Cellophane Co. It is tough and durable, but becomes extremely soft and pliable when wet, precluding any possibility of scratching the most highly polished surface, and will outlive the natural product. Product is made of highly purified wood and cotton cellulose pulps, its sponge-like construction being the result of reactions.—(From *Chemical Industries)*

◆ ACCORDING TO INFORMATION published by the Department of Commerce, hats made of paper yarn are on initial display at one of Prague's smartest hat shops, according to a recent report from Commercial Attache Sam. E. Woods, Prague. These hats, imitating straw, are a novelty of the season and are very attractive despite the faded brown color. They sell at prices ranging from about $1.00 to $2.50.

◆ William H. Phillips Rejoins Worthington

William H. Phillips, recently with Harry Pratt Company of Chicago, has joined the Worthington Pump and Machinery Corporation as Power Plant Specialist with headquarters at the corporation's Chicago office.

Mr. Phillips was formerly for many years with the Worthington Pump and Machinery Corporation. He will specialize on condensers, steam-air ejectors, feedwater heaters and boiler feed pumps.

◆ Joseph H. Wallace

Joseph H. Wallace, a well-known figure in the paper industry, passed away July 7 at Hamilton, Ohio, at the age of 67 years.

Mr. Wallace was a native of Worcester, Mass., and a graduate of Worcester Polytechnic Institute. After graduation, he served two years with the U. S. Lighthouse Service on the coast of Maine developing fog signals.

Thereafter he became associated with A. B. Tower, who was then the outstanding paper mill engineer. George F. Hardy and Hardy S. Ferguson, well-known paper mill engineers, were also

Joseph H. Wallace

associated with Mr. Tower, Mr. Hardy as a partner. In a few years the company became Tower & Wallace, and many successful mills were built by this partnership.

In 1901, Mr. Wallace started his own firm under the name of J. H. Wallace & Co. and in the course of his active career built many paper mills such as the Spanish River Pulp and Paper Company's plant at Escanaba, Mich., the Paper Manufacturers Ltd. mill at Greenhithe, England, the Kalamazoo Paper Company mill, The Oxford-Miami Paper Company mill at West Carrollton, Ohio, and many others. He also established an office in London in 1904 and for many years spent part of his time there.

One of Mr. Wallace's interests was the utilization of southern woods. He designed, built and operated for three years the Southern Paper Company's plant at Moss Point, Miss. This started the successful manufacture of kraft paper in this country. He established laboratories near Stamford, Conn., and among other problems did pioneer work on the use of southern wood for white papers. Processes were there developed for the profitable extraction of turpentine, rosin and pine oil. Experiments were also carried on for the perfection of uniform raw materials for the manufacture of higher grade papers. Mr. Wallace also experimented successfully with bagasse straw for papermaking.

From 1925 to 1930, Mr. Wallace was engaged in the manufacture of glassine paper, first as president of Westfield River.

In 1931 he joined the Black-Clawson Company and was associated with that organization and the affiliated Shartle Brothers Machine Company in the manufacture and sale of its complete line of paper mill machinery.

Mr. Wallace was a man of broad interests and professional attainments, and he will be missed by a wide circle of friends and business associates. He is survived by his widow and a daughter.

◆ Celotex Takes Over New Jersey Plant

A press announcement states that the Celotex Corporation has acquired the plant of R. J. Scott & Co., Metuchen, N. J., manufacturers of asphalt roofing materials.

This property it is expected will be used for the manufacture of new products now under development.

◆ Norma-Hoffmann Has Twenty-Fifth Anniversary

The Norma-Hoffmann Bearings Corp., Stamford, Conn., is celebrating its first twenty-five years of service to American industry. Founded in 1911 by Walter M. Nones, its president, the company was the first to introduce Precision bearings to the American market.

Today, the company can supply bearings in inch and metric sizes, and there are 108 distinct series, representing approximately 3,000 types and sizes.

◆ THE CONTROL EQUIPMENT CORPORATION, Buffalo, N. Y., announces that exclusive rights to manufacture and sell its products in Canada and Newfoundland have been granted to Waterous Limited, of Brantford, Ontario.

◆ Care of Chains

The chain, the vital part of most material handling equipment, seems and is considered by many to be of little importance. For that reason, enough care is not used in replacing chains or even in installing originally.

For all drives and all horizontal conveyors, run the closed or hook end first. Always run bar or open end first for all vertical and inclined elevators and inclined conveyors where the foot shaft runs idle. When the angle of inclination in conveyors is such that the return strand has a decided tendency to impart power rather than to require it, the direction of travel of chain is governed by the last rule. When of a lesser angle, the direction of travel of chain is governed by the first rule. Do not operate chains at a speed greater than the maximum speed rating. The most economical speed from the standpoint of life and service is but half of the maximum rating.

◆ New Catalogues and Publications

Abart Gear & Machine Co., 4834 W. 16th St., Chicago—A new bulletin, No. 1200, gives engineering data on this company's straight-line drive, spur gear speed reducers, type CA, in ratios up to 20-1. The different types of these units are graphically explained by diagramatic drawings, and there are tables giving horsepower ratings at input r. p. m.

American Engineering Co., Philadelphia—The Lo-Hed Hoist Division of this company announces a new folder entitled "Handle Materials via Lo-Hed" including a brief description of the ¼, ½ and one ton monorail hoists and the stationary hoists with tables of capacities and ratings.

Beaver Pipe Tools, Inc., Warren, Ohio.—A new 8-page bulletin describes in detail Beaver Model-A Special and Standard Pipe Machines. There is a complete analysis of both machines which is given with illustrations, tabular data, prices, shipping weights, etc.

Flexrock Company, 800 N. Delaware Ave., Philadelphia—A new folder describes the special free engineering service, mechanical details about this company's Ruggedwear Resurfacer and contains numerous valuable suggestions.

B. F. Goodrich Co., Akron, Ohio—The 1936 edition of this company's annual "Operator's Handbook" has just been published. This edition contains even more statistical information than previous volumes. There is detailed data on tires and tire performance of interest to owners and operators of trucks and tractors. One page is devoted to a discussion of "Why Tires Fail;" two pages to a description of the new tire calculator designed to reveal exact truck tire costs, and the methods of its operation. There are many other interesting subjects clearly discussed. Copies on request.

D. W. Haering & Co., Inc., 3408 W. Monroe St., Chicago—"The Art of Proportioning," is the title of a 12-page booklet just issued describing the applications of liquid proportioning units employing the fluid piston principle. Included are several types of units required for handling the various liquids utilized in the process industries. Copies gratis.

National Adhesives Corp., 320 Greenwich St., New York—A novel and handy source of information to users of transparent cellulose tissues is the Mikah "Cellu-Meter" issued by this company. By dialing the "Cellu-Meter," specific adhesive recommendations are immediately obtained for sealing, combining and laminating plain and moisture-proof materials. The "Cellu-Meter" supplements the company's booklet which tells how to glue transparent wrappings and is part of the company's extensive program to educate users of glues in general and of transparent tissues in particular, in the proper use of adhesives. Copies of both on request.

Precision Scientific Co., 1750 N. Springfield Ave., Chicago—This company's complete line of Kjeldahl equipment for digestions and distillations such as is used for nitrogen and protein determinations is covered in Bulletin 151. Complete specifications are given on Multi-tube distillation condensers, Multi-hood fume pipes, Tellurium lead fume exhaust, fume exhaust blowers, micro-apparatus, combination set-ups electric circuit breakers, heaters, gas burners and inexpensive conventional set-ups for digestions and distillations. The bulletin is profusely illustrated and actual prices for most of the items mentioned are shown.

Wishnick-Tumpeer, Inc., 295 Madison Ave., New York—A new technical booklet entitled "Witco Products—Chemicals, Oils, Pigments," has just been issued by this company. This booklet presents in convenient reference form, complete data on more than fifty of the various products manufactured and sold by the company. Technical information, specifications, properties, applications and commercial information are covered. The book is indexed by consuming industries served by the company, and the products are divided into seven major industrial classifications, including the printing industry and the paper industry. Copies on request.

Yarnall-Waring Co., Chestnut Hill, Philadelphia—"What Makes the Yarway Steam Trap Work" is the subject of a new four-page bulletin. The question is answered by explanatory cross-sectional drawings in color and some salient points brought out in the text. A folder, T-1721, outlines the construction and operating features of the Yarway Trap.

BOOKS

Blue Book of Southern Progress—The 1936 edition of this important annual publication contains latest available information on the industrial activities of the south as well as on population, imports and exports, bank resources, and farm production. One section treats of the timber situation, while another presents some pertinent data on the pulp and paper making opportunities of the region. It is a paper covered book of more than 80 pages which can be obtained direct from the publisher, Manufacturers Record Publishing Co., Baltimore, Md., for 50 cents per copy.

Boiler Feed Water Treatment—In this book, the author, F. J. Matthews, has grouped his material into five major sections—natural water supplies, scale formation, corrosion, foaming and priming, and analysis and routine testing.

The section on natural water supplies is brief; the other remaining sections are individually quite extensive.

Among the subjects treated in the section on scale formation are: effects of scale, lime-soda process of water treatment, the use of sodium aluminate with lime-soda treatment, Zeolite or base exchange softeners, treatment of alkaline waters, condensate as feed water, water blending, lime-barium softeners, necessity for conditioning, mechanism of scale formation carbonate and phosphate conditioning and the use of pyro- and meta-phosphates.

In addition to other things, the section on corrosion discusses the theories of corrosion, corrosion inhibitors, de-aeration by chemical and physical methods, corrosion due to unstable salts, danger of soft water, corrosion by carbon dioxide, corrosion from boiler sludge, caustic embrittlement, and aplication of pH control; while the section on foaming and priming takes up the causes and prevention of priming, foam stabilization, blow-down control, use of condensate and blending of waters and the removal of oil from water.

The fifth section of the book, analysis and routine testing, covers control tests for softening and for treated water as well as the routine necessary for making a general water analysis.

The book, an English work that is partially illustrated with equipment common to that country, may be obtained through Chemical Publishing Co. of N. Y., Inc., 148 Lafayette St., New York, at $5.00 per copy.

Corrosion Resistance of Metals and Alloys—Robert J. McKay and Robert Worthington, joint authors of this book which is an American Chemical Society Monograph, state that its purpose is to summarize the facts on corrosion processes and rates. The book is made up of two major parts, the first of which covers general and theoretical material, while the second treats of the corrosion behavior of special metal and alloy groups. In Part I is included a chapter on each of the following: rate factors, forms of corrosion, corrosives, and metal corrosion properties. The specific metal and alloy groups discussed in Part II include magnesium, aluminum, zinc, cadmium, tin, lead, iron and steel, silicon iron, molybdenum alloys, chromium alloys and plate, nickel-iron and nickel-copper alloys, nickel, copper, and high-copper alloys.

The text includes 313 tables and 66 figures. In addition there is a bibliography at the end of each chapter while an author and subject index conclude the book.

The book should prove a valuable compendium and reference work to anyone interested in the subject of corrosion. It is a work of nearly 500 pages that is priced at $7.00 per copy by the Reinhold Publishing Corporation, 330 West 42nd Street, New York, and from whom it may be obtained.

Directory of Paper Makers of Great Britain and Ireland—The 1936 edition (60th annual issue) of this publication has been brought up to date in each of its various sections which include in part individual listings of paper and millboard makers in Great Britain and Ireland; paper enamellers, surfacers, varnishers, gummers, embossers, etc.; paper makers' representatives; paper mills by counties; trade names; and china clay producers and merchants. It also includes a section on classification of makes, another on paper trade customs, and a special article which treats of the past year in the paper trade. It is a work of a little more than 300 pages, each 7" x 10¼", that is bound in stiff board cover. The book, priced at 5 s. 8 d. for foreign mailing, is published by Marchant Singer & Co., 15, Nicholas Lane, London, E. C. 4, England.

Discussion of Industrial Accidents and Diseases—This publication issued by the Division of Labor Standards, U. S. Department of Labor, is a report of the 1935 Convention of the International Association of Industrial Accident Boards and Commissions, held at Asheville, N. C., September 30 to October 3, 1935. The complete text of addresses on the title subject and the discussions which followed are given. This bulletin is designated as Bulletin No. 4, and may be obtained from the Superintendent of Documents, Washington, D. C., for 20 cents per copy.

Handbook of Colorimetry—This book is concerned with the basis for the interpretation of data obtained from physical measurements of colored materials, which may be expressed either in purely physical terms or in terms of the response of the normal observer as defined by the International Commission on Illumination in 1931. It not only surveys the entire subject of colorimetry, but also discusses the characteristics of light sources, the physical measurements of colored materials and the laws of color mixture. The recommendations of the International Commission on Illumination interpolated to wave length intervals of one millimicron, likewise, are included.

The preparation of this volume was undertaken by the staff of the Color Measurement Laboratory of the Massachusetts Institute of Technology, under the direction of Professor A. C. Hardy, as an essential part of its research program. It is the result of three years work and its aim is to facilitate the specification of color both in the laboratory and in industry.

The book, with a page size of 10" x 13" is printed on an excellent grade of paper stock and is bound in an attractive black cloth cover. Care also has been used in laying out the pages, in selecting the type and in handling the numerous tables and illustrations. The result is a work that is both readily legible and durable.

The "Handbook of Colorimetry" sells for $5.00 per copy and may be obtained direct from The Technology Press, Massachusetts Institute of Technology, Cambridge, Mass.

◆ Finland to Have Two New Mills

Rumors have long been current that plans for building another large sulphate mill in Southern Finland were considered. These have now definitely matured, and five well-known wood-working concerns, viz.: A. Ahlström O. Y., Tammerfors Linne- & Jern-Manufaktur A.-B., Ythyneet Paperitehtaat O. Y. (The United Paper Mills Ltd.), Enso-Gutzeit O. Y., and Kymmene A.-B. have for this purpose between them formed a company called the Sunila O. Y., with a share capital of 60 mill. Fmk.

The mill will be designed for an output capacity of 80,000 tons per annum, with provisions for enlarging it to 120,000 tons. The constructional work will begin as soon as possible, and the mill, it is said, will be ready to start work within two years.

Two sulphate mills already exist at Kotka: the Lojo of 15,000 and the Enso-Gutzeit of 32,000 tons capacity; the latter is now being enlarged to a capacity of 60,000 tons.

Äänekoski A.-B. has recently decided to build a mill with an annual capacity of 40,000 tons of unbleached sulphite pulp in conjunction with their Äänekoski paper mill. Building operations will begin in a month or two, and the plant is expected to be ready for use in the summer of 1937.

At present the company owns a mechanical pulp mill producing 20,000 dry tons annually, a 3,000-ton carton mill, and a 16,000-ton newsprint mill, besides sawmills producing normally about 11,000 stds. Part of the output of the new sulphite mill will probably be used for the company's own paper production, but as not more than 4 or 5,000 tons of sulphite pulp has so far been consumed, a considerable quantity of sulphite will be left over for sale, unless the manufacture of paper be extended and changed.

The company has recently announced its intention to issue a new 5 per cent debenture loan of 30 mill Fink.

—(From *Svensk Pappersmasse-Tidning.)*

◆ Annual Printing Exhibition
American Institute of Graphic Arts

The American Institute of Graphic Arts has issued a call for specimens for the 1936 annual exhibition of commercial printing. The exhibition will open in New York, October 20, and will run through November 7, at the Architectural League, 115 East 40th Street.

The term "printing" is understood to include any and all commercial reproduction processes such as letter press, lithography, offset, rotogravure, photogravure, photo-gelatine, etc.

Entries will be judged and exhibits shown under five classifications as follows:

(1)—Booklets, books (for advertising), catalogues, house organs.

(2)—Folders and broadsides.

(3)—Stationery and forms.

(4)—Display and novelty pieces.

(5)—Publication advertisements.

Certificates of merit will be awarded for all entries selected for hanging. This selection will be made by a distinguished jury, representative of all phases of the graphic arts. A hanging fee of two dollars will be charged for each specimen that is accepted by the jury to be shown in the exhibition.

After the opening in New York, the exhibits will be shown in cities throughout the country. This traveling exhibition has for years been a feature wherever it has gone. It is viewed by thousands interested in the graphic arts.

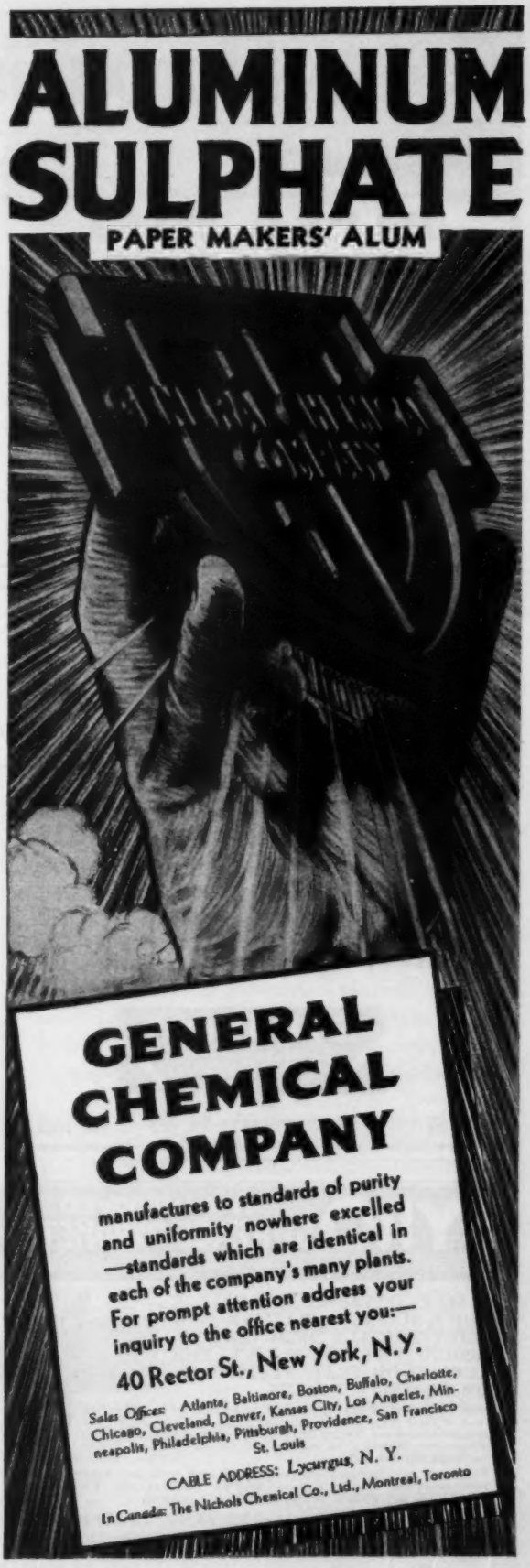
Specifications and Conditions

(1)—Specimens may be submitted by the designer, printer, advertising agency, or the client for whom executed, and must have been produced in the United States or Canada since September, 1935.

(2)—Specimens must be sent prepaid, addressed to: Commercial Printing Committee, American Institute of Graphic Arts, 115 East 40th Street, New York.

(3)—Each specimen submitted must have a separate slip attached, bearing the following information:

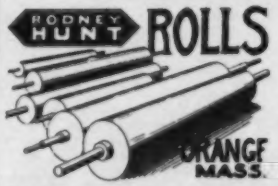
Name and address of Exhibitor (stating whether the de-


ALUMINUM
SULPHATE
PAPER MAKERS' ALUM
GENERAL
CHEMICAL
COMPANY
manufactures to standards of purity and uniformity nowhere excelled —standards which are identical in each of the company's many plants. For prompt attention address your inquiry to the office nearest you:—
40 Rector St., New York, N.Y.
Sales Offices: Atlanta, Baltimore, Boston, Buffalo, Charlotte, Chicago, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, Philadelphia, Pittsburgh, Providence, San Francisco St. Louis
CABLE ADDRESS: Lycurgus, N. Y.
In Canada: The Nichols Chemical Co., Ltd., Montreal, Toronto

PAPER MILL

WOOD ▾ METAL ▾ RUBBER

"Shaf-Tite" Rolls



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CANAL GATES
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VARIABLE SPEED DRIVES
TANKS, VATS, ETC.
ENDLESS FELT WASHERS

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38 Maple Street, Orange, Mass.

CARTHAGE MACHINE CO.
Carthage, New York
« « «
Machinery for Ground Wood and Chemical Pulp

LINING ENGINEERS

STEBBINS Engineering & Manufacturing Company

SEATTLE WATERTOWN, N. Y. MONTREAL

PYRO THE IMPROVED SURFACE PYROMETER

A SELF-CONTAINED, RUGGED, QUICK-ACTING, ACCURATE AND SCIENTIFICALLY DESIGNED PRECISION INSTRUMENT FOR CURVED OR FLAT, STATIONARY OR MOVING SURFACES.

Due to patented clamping-device embodied in indicator —A PYRO FEATURE—contact and reading of actual temperatures no longer have to be made simultaneously. Extension handles to meet your requirements. Write for bulletin No. 00.

For coal ash fusion determinations and recovery furnace temperatures, etc., request special bulletin on PYRO OPTICAL or PYRO RADIATION pyrometer.

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WANTED—48" graining machine. Suitable for high class graining of box board. Address Box 241, THE PAPER INDUSTRY.

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Pulp Bleaching—a symposium.

Papermaking Research Around the World, by Dr. Louis E. Wise.

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Lessons in Paper Making, Part 1, by Harry Williamson.

Lessons in Paper Making, Part 2, by Harry Williamson.

Practical Helps for the Mill Man.

Each one of these publications contains a wealth of information, and they are priced at only fifty cents per copy prepaid.

THE PAPER INDUSTRY
333 North Michigan Avenue
CHICAGO • ILLINOIS

signer, printer, advertising agency, or client for whom executed).

Classification of entry.

Title.

(4)—Specimens must be postmarked not later than the closing date, September 15th.

(5)—Only *one* copy is required at time of submission, but one *additional* copy must be available in case selected for hanging.

(6)—Subject to the conditions embraced in the "Statement of Aims and Platform" below, any piece of commercial printing is eligible which does not exceed a flat size of 22 x 28 inches.

(7)—Specimens will not be returned unless such request accompanies entry and return postage is enclosed.

Statement of Aims and Platform

In order to clarify the basis on which exhibits are selected and principles on which awards will be made, the following platform has been adopted:

(1)—This exhibition is intended to be a record of the best commercial printing of the year.

(2)—It embraces material which has been produced chiefly through the arts and processes commonly included in the graphic arts. That is, it embraces printing or printed processes distinguished in any or all of the following elements: Layout, design, color, typography, presswork, paper, binding.

(3)—The basis of selection is twofold: first, the standards of good taste, creative excellence, and craftsmanship for which the A.I.G.A. stands; second, the practical application and effectiveness of each piece for the purpose intended.

(4)—The merit or lack of merit in text or "copy" is not a factor—only the suitability of the printed vehicle to the message it carries.

(5)—While pfeces produced as examples or demonstrations will be accepted, perference will be given pieces which have been produced and sold as commercial jobs.

(6)—This exhibit is not concerned with periods or styles. with modernism or classicism, but only with appropriateness and with practical application.

THE first essential to the successful operation of any Paper Mill is an adequate and dependable supply of pure water. To successfully produce this water, everything depends upon skill, wide experience, modern drilling equipment and high efficiency pumps. In all these the name "Layne" stands foremost throughout the world.

If you are contemplating new wells or the purchase of new pumps you can profit by this valuable experience. There is no obligation. For illustrated literature on Layne Pumps and Wells, write Layne & Bowler, Inc., Dept. P, Memphis, Tenn., U.S.A.

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LAYNE-ARKANSAS CO., Stuttgart, Ark.—LAYNE-ATLANTIC CO., Norfolk, Va.—LAYNE-CENTRAL CO., Memphis, Tenn.—LAYNE-NORTHERN CO., INC., Mishawaka, Ind.—LAYNE-LOUISIANA CO., INC., Lake Charles, La.—LAYNE-NEW YORK CO., INC., New York City—LAYNE-NORTHWEST CO., Milwaukee, Wis.—THE LAYNE-OHIO CO., Columbus, Ohio—LAYNE-BOWLER NEW ENGLAND CO., Boston, Mass.—LAYNE-TEXAS Co., Houston, Tex.—LAYNE-WESTERN CO., Kansas City, Mo., Chicago, Ill., and Minneapolis, Minn.—INTERNATIONAL WATER SUPPLY, LTD., Fort Erie, N., Ontario, Can.

LAYNE PUMPS and WELL WATER SYSTEMS

Quality Bleaching INSURANCE!

Strict adherence to exacting production standards has placed SOLVAY Liquid Chlorine to the fore as the bleaching agent upon which the industry can depend. Always full strength, always pure, always uniform—it meets *every* quality demand.

In service and distribution, too, the name SOLVAY is your guarantee of fast, sure, on-time deliveries. Full information and prices on request. Ask for *free* copy of 44-page book on "Solvay Liquid Chlorine."

SODA ASH—Graded to meet every need of the industry and produced to conform to SOLVAY standards. Light—Dustless Dense—Extra Light (Fluf).

Caustic Soda (Solid, Flake, Ground, Powdered, Liquid)
Calcium Chloride — **Special Alkalies**
Modified Sodas — **Sodium Nitrite**
Caustic Potash (Liquid, Flake, Ground, Solid, Lump)
Ammonium Chloride — **Ortho-dichlorobenzene**
Para-dichlorobenzene — **Ammonium Bicarbonate**
Potassium Carbonate (Liquid 47%—Granular Hydrated 83-85%—Dustless Calcined 98-100%)

SOLVAY SALES CORPORATION

Alkalies and Chemical Products Manufactured by The Solvay Process Company

40 Rector Street — **New York**

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Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

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CHEMICAL PULP MILL ENGINEERS

CHEMICAL PULPING PROCESSES, OPERATING SURVEYS
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VEST POCKET POWER PLANTS

Small space occupied, any capacity, low over-all operating costs, high and extreme efficiencies, reliability, low initial investment.
Complete power plants to meet any operating conditions of Pulp and Paper mills or other Industrial service. Engineering and Construction.
Satisfactory Services Always Guaranteed.

FERGUSON ENGINEERS

Power Specialists
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MISCO "C"

THE CORROSION RESISTANT ALLOY

CAST • ROLLED • FABRICATED

for all equipment exposed to corrosion by sulphite acids

MICHIGAN STEEL CASTING CO., DETROIT, MICH.

Use **LAMOTTE EQUIPMENT** *for*

pH Control—Residual Chlorine Control
Boiler Feed Water Control

LAMOTTE CHEMICAL PRODUCTS CO.
436 Light Street, Baltimore, Md.

THE NEW **FULTON SYSTEM**
FOR
BOARD • KRAFT • STRAW
MACHINES

1. Increases Production from 10% to 30%.
2. Saves up to 50% in Steam Consumption.

Write for Bulletin No. 40.

Midwest-Fulton Machine Company
DAYTON, OHIO

"READY DRESSED" **MILL COGS**

LABOR SAVING—TIME SAVING

THE MOST ECONOMICAL FILLINGTHAT CAN BE PUT IN A MORTISE WHEEL

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Blank Head

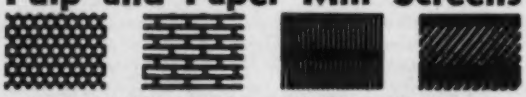
WE MAKE ANY STYLE OR SIZE WANTED

WRITE FOR INSTRUCTION SHEET "O" WHICH IS FREE

QUICK SERVICE ON ALL SIZES

THE N. P. BOWSHER CO., So. Bend, Ind.

Pulp and Paper Mill Screens



of STAINLESS STEEL—COPPER—BRONZE—
MONEL—CHEMICAL RESISTING ALLOYS

Perforations that are accurate in size and alignment
ANY METAL •• ANY PERFORATION

the Harrington & King PERFORATING Co.

5654 Fillmore St., Chicago, Ill., ◆114 Liberty St., New York, N.Y.

The best test of the value of a Fourdrinier wire is on a paper machine. There can be no substitute for that experience.

Lindsay Fourdrinier Wires

successfully meet that test. We furnish them in *Longcrimp* and *Modified Longcrimp, Duo-Wear* and *Regular Weave.*

The Lindsay Wire Weaving Co.
14025 Aspinwall Avenue Cleveland, Ohio

The Paper Industry Safety Contest

July 1, 1935 to June 30, 1936

Cumulative Scores as of June 30

PERFECT SCORES

Division I—Paper and Pulp Mills

	PARTICIPANT	MILL	LOCATION
GROUP A (none)			
GROUP B (none)			
GROUP C	International Paper Co.	Little Island	No. Tonawanda, N. Y.
	Continental Paper & Bag Corp.	York Haven	Pennsylvania
GROUP D	Harriman Company	Harriman	Tennessee
	International Paper Co.	Webster	Orono, Maine
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	Hollingsworth & Whitney Co.	Aroostook & Cobbossee	Gardiner, Me.
	U. S. Gypsum Co.	No. Kansas City	Missouri
	Central Fibre Products Co., Inc.	Vincennes	Indiana
	Spaulding Fibre Co., Inc.	Milton	New Hampshire
	Hollingsworth & Whitney Co.	Abenaquis	Madison, Me.
	Mead Paperboard Co.	Rockport	Indiana

Division II—Remanufacturing

	Union Bag & Paper Corp.	Specialty	Hudson Falls, N. Y.
	Kimberly-Clark Corp.	Atlas	Appleton, Wis.
	Texas Corrugated Box Co.	Dallas	Texas
	U. S. Gypsum Co.	Genoa	Ohio
	Bemis Bros. Bag Co.	East Pepperell	Massachusetts

IMPERFECT SCORES

	Key Number	Rank	Disabling Injuries	Frequency Rate
GROUP A	P-108	1	1	.368
	P- 30	2	8	4.188
	P- 27	3	18	5.926
	P- 44	4	10	6.179
	P- 10	5	10	6.477
	P- 19	6	11	7.147
	P- 13	7	15	8.263
	P- 1	8	23	8.821
	P-101	9	14	9.901
	P- 18	10	20	10.125
	P- 62	11	22	10.558
	P- 99	12	22	12.215
	P- 12	13	18	12.387
	P- 3	14	18	12.393
	P- 64	15	21	12.477
	P- 67	16	31	12.547
	P-105	17	38	13.447
	P-102	18	27	13.648
	P- 78	19	18	13.653
	P- 23	20	21	14.816
	P- 73	21	39	18.817
	P- 95	22	27	19.928
	P-114	23	36	24.375
	P- 40	24	32	25.888
	P- 87	25	49	29.350
	P- 74	26	73	36.299
	P- 32	27	59	48.201
	P- 71	28	79	56.558
GROUP B	P- 70	1	2	1.737
	P- 15	2	2	2.167
	P- 22	3	4	3.931
	P- 11	4	4	4.275
	P- 51	5	4	5.014
	P- 68	6	5	5.049
	P- 31	7	7	6.547
	P- 26	8	9	8.000
	P- 72	9	6	8.134
	P- 21	10	11	10.657
	P-112	11	9	11.162
	P- 25	12	14	11.779
	P- 54	13	10	11.850
	P- 3	14	11	12.830
	P- 60	15	14	15.363
	P- 16	16	15	16.789
	P- 82	17	19	19.411
	P- 45	18	25	27.667
	P- 4	19	22	30.132
	P-104	20	25	33.567
	P- 76	21	30	37.685
	P- 77	22	50	58.338
GROUP C	P- 56	3	1	1.746
	P- 97	4	1	3.541
	P- 52	5	2	3.705
	P- 61	6	4	8.174
	P- 59	7	6	8.671
	P- 43	8	4	9.049
	P- 55	9	6	9.366
	P- 46	10	7	10.549
	P- 37	11	9	15.743
	P- 47	12	7	15.781
	P- 29	13	10	17.679
	P- 88	14	11	17.697
	P- 49	15	7	17.785
	P- 48	16	10	18.722
	P- 17	17	9	18.974
	P- 41	18	10	19.525
	P- 34	19	10	22.593
	P- 75	20	15	24.407
	P-103	21	10	25.100
	P-111	22	14	27.328
	P- 89	23	15	28.163
	P- 33	24	21	40.426
	P- 14	25	16	41.028
	P-113	26	31	51.632
	P- 50	27	23	61.945
GROUP D	P- 7	10	1	2.926
	P- 92	11	1	7.917
	P- 66	12	1	9.745
	P- 53	13	3	13.516
	P-117	14	4	14.780
	P- 81	15	5	17.535
	P-116	16	6	18.233
	P- 65	17	3	19.263
	P- 90	18	4	19.875
	P- 6	19	8	24.205
	P- 8	20	4	25.082
	P- 42	21	5	25.090
	P- 85	22	2	27.080
	P- 98	23	8	27.912
	P- 94	24	9	31.111
	P- 36	25	7	31.168
	P- 80	26	11	31.786
	P-115	27	3	32.625
	P-118	28	8	33.171
	P- 24	29	8	45.203
	P-106	30	14	46.817
	P- 99	31	8	47.955
Division II				
	R-11	6	1	5.026
	R- 5	7	7	6.873
	R-20	8	8	7.559
	R- 9	9	2	7.967
	R- 3	10	2	8.032
	R- 2	11	7	8.643
	R- 6	12	13	10.265
	R-18	13	3	10.989
	R- 1	14	5	12.435
	R-21	15	11	12.614
	R-10	16	10	17.982
	R-14	17	4	33.666

Reports Delayed:

11 Months Total only—P-24, P-78, P-92, P-114.

10 Months Total only—R-18.

Withdrawn: P-79, P-83, P-107, R-16, R-17.

◆ THE ABOVE SCORES are the closing statistics in the twelve-month 1935-1936 Safety Contest of the Pulp and Paper Section. They are, however, tentative figures and must not be construed as announcing the group winners or as being final. All records will be checked carefully by the National Safety Council headquarters before a final report is published. As there has not been sufficient time in which to audit the statistics since the last reports were received, the final report and announcement of winners will not be made until the 25th annual safety congress in Atlantic City, October 5 to 9, 1936.

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ADVANTAGES PREFERRED

LOTOL* can add *real selling advantages* to *your* products. It has many applications. For example . . .

LOTOL* gives artificial leather those qualities most sought for . . . unusual *toughness, pliability*, and *moisture resistance.*

Impervious to temperature changes and resistant to water, LOTOL* is a superior cementing and laminating agent. Used on paper or cloth, it forms an even, tenacious bond.

LOTOL*-treated stocks are ideal for cartons and bags because of their perfect anchorage, greater moisture resistance, toughness, and pliability. A carton or bag made of LOTOL*-treated stock and sealed with LOTOL* cannot be opened without destroying the package.

LOTOL* will solve many of *your* problems . . . give *your* products added *selling advantages.*

LOTOL* PROCESSED LATEX

* LOTOL is our trade name for Latex in any form.

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1790 BROADWAY NEW YORK, N. Y.

BARGAINS IN HIGH GRADE REBUILT EQUIPMENT

MOTORS
220/440 V., 60 Cy., 3 Phase

(1)	250—C. Wheeler	Sq. Cage	1800	(1) 50—G. E. K. T.	1800
(1)	200—G. E.	Sq. Cage	1800	(2) 50—WEM CS.	1800
(1)	150—G. E.	Sq. Cage	1800	(6) 50—G. E. K. T.	900
(1)	150—WEM CS.	Sq. Cage	1200	(1) 50—G. E. K. T.	1200
(1)	100—WEM CS.	Sq. Cage	1800	(2) 40—WEM CS.	1800
(1)	100—WEM CS.	Sq. Cage	1200	(3) 40—G. E. K. T.	680
(1)	75—Allis		1800	(4) 40—G. E.	600
(2)	75—G. E. K. T.		1200	(1) 75—WEM CS.	900
(1)	60—G. E. K. T.		1800		

Also, about 1000 other ratings, from ¼ H. P. up.
2—Ridgeway Synchronous MG sets, 150 KW, 275 V. DC, 2300/60/3 AC with AC and DC panels.

MOTORS
2200 V., 60 Cy., 3 Phase

(1)	300—Allis	Sq. Cage	900
(3)	200—WEM CS.	Sq. Cage	1800
(1)	200—Allis	Sq. Cage	1800
(2)	300—G. E.	Sq. Cage	1200
(2)	100—WEM CS.	Sq. Cage	1200
(2)	75—G. E. M. T.	Slip ring	600
(3)	50—G. E. M. T.	Slip ring	600
(1)	50—G. E. M. T.	Slip ring	900
(1)	75—G. E. M. T.	Slip ring	900
(1)	125—Allis	Slip ring	435

220/440 V., 60 Cy., 3 Phase

(1)	200—WEM CW.	500
(2)	250—WEM CW.	680
(1)	150—WEM CW.	585
	3 bearing with chain drive	
(1)	100—G. E. M. T.	900
(1)	75—G. E. M. T.	720
(1)	75—WEM CW.	900
(2)	75—G. E. M. T.	900
(1)	75—G. E. I. T. C.	900
(1)	75—WEM CI.	870
(2)	60—G. E. M. T. C.	900
(1)	50—G. E.	900

UNUSUAL OPPORTUNITY

Westinghouse Type SK Motors, 230 Volts.

90—	3	H.P.	1150 R.P.M.	65—	7½	H.P.	850 R.P.M.	9—20	H.P.	850 R.P.M.	
43—	3	H.P.	1750 R.P.M.	1—10	H.P.	375 R.P.M.	46—20	H.P.	1150 R.P.M.		
47—	3½	H.P.	850 R.P.M.	2—10	H.P.	300/1200 R.P.M.	21—20	H.P.	1750 R.P.M.		
162—	5	H.P.	850 R.P.M.	2—10	H.P.	600 R.P.M.	6—25	H.P.	1150 R.P.M.		
76—	5	H.P.	1150 R.P.M.	35—10	H.P.	850 R.P.M.	4—25	H.P.	850 R.P.M.		
31—	5	H.P.	1750 R.P.M.	41—10	H.P.	1150 R.P.M.	1—30	H.P.	1750 R.P.M.		
17—	5	H.P.	3450 R.P.M.	34—15	H.P.	1750 R.P.M.	2—30	H.P.	1150 R.P.M.		
28—	7½	H.P.	1750 R.P.M.	17—15	H.P.	1150 R.P.M.	1—30	H.P.	975 R.P.M.		
78—	7½	H.P.	1150 R.P.M.	11—15	H.P.	1750 R.P.M.	1—30	H.P.	775 R.P.M.		

2—30	H.P.	850 R.P.M.	
14—40	H.P.	775 R.P.M.	
2—40	H.P.	1750 R.P.M.	
3—40	H.P.	1150 R.P.M.	
2—50	H.P.	680 R.P.M.	
3—50	H.P.	225/350 R.P.M.	
3—50	H.P.	1150 R.P.M.	
5—60	H.P.	680 R.P.M.	
4—75	H.P.	1150 R.P.M.	
3—100	H.P.	1150 R.P.M.	

The above is only a partial list of equipment on hand. We have a large stock of transformers in various voltages —other M. G. Sets—Pumps—Industrial and Mine Hoists—Locomotives—Air Compressors, etc.

All equipment thoroughly rebuilt in our own Shop and guaranteed.

Phone, write or wire your inquiries and send us lists of equipment you have for disposal.

PENN ELECTRICAL ENGINEERING COMPANY

517 Ash Street **Scranton, Penna.**

CONTROL EQUIPMENT CORPORATION

Consistency Controllers
Stock Metering Equipment
Write us of your Control Problems

CONTROL EQUIPMENT CORP. PROCESS CONTROLS BUFFALO, N.Y.

Water Dispensing Systems
Pressure, Flow and Gate Controls
BUFFALO, NEW YORK

HALF AGAIN

as much shower-pipe velocity
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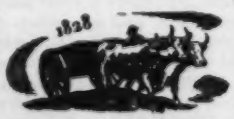

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POWER

GENERATION + UTILIZATION + MAINTENANCE

This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.

By W. S. JOULE

◆ Deterioration of Lighting Deserves Attention

Deterioration in illumination from using lamps beyond their useful period of life or from not paying enough attention to the accumulation of dust and other substances on reflecting surfaces, is quite generally overlooked, and yet the expense of preventing it is more than offset by the results obtained. The second cause of deterioration in lighting is really the more serious.

While the average light output of the gas-filled lamp during its life is less than 5 per cent below the initial output, four weeks of lack of attention to reflectors will cut down the lighting from 10 to 25 per cent and sometimes nearly double even the last amount.

Attention to cleanliness, therefore, saves useful light to a very marked degree. Lamps neglected may be actually running at a virtual efficiency fully a third below the normal figure.

◆ Types of Soot Blowers

Soot blowers are divided into two general classes: the blower of the portable hand operated type, such as the steam lance, and the permanently fixed types which are operated by means of chains or levers. In the case of either of these types there is also a further subdivision, depending on whether the boiler is of the water tube or fire tube type.

Blowers of the hand type have been extensively used in the past, but with the increasing size of boiler settings and the consequent difficulty of reaching all parts of the working surface, without taking the boiler out of service, the fixed types are more generally used.

It is probable that in small plants the hand blowing equipment will continue to be used unless economic considerations warrant the installation of fixed blowers. Even where permanently installed cleaners are in use, however, many companies continue to use the hand lance for cleaning at times when the boiler is taken out of service for a complete overhauling.

Development of fixed blowers has not been a problem easy of solution on account of the severity of the operating conditions. It has been necessary to design the blowing elements with regard to the high temperatures encountered, proper placement in the boiler to insure the cleaning of all parts of the surface, and the development of an operating mechanism that would conserve steam and yet not allow such a rapid action as to slight the work.

Probably the most attention has been given to the effect of high temperatures on the blowing elements. Air cooled, heat treated and sheathed elements, and of late the use of special high temperature alloys, are some of the methods which have been adopted to solve this problem. As a result, such apparatus has now reached a point where a reasonably long life may be expected of fixed soot blowers even though operated under high temperatures.

◆ Restoring Worn Storage Batteries

Lead storage batteries that have deteriorated somewhat can usually be restored to some extent by repeated charge and discharge at full rate, using the same source of current and resistance that is used for charging. Low-voltage batteries of 6 volts or 12 volts are usually charged through a bank of lamps, but very few electricians discharge them at the proper rate, because they cannot find suitable resistors of sufficient capacity and at a reasonable price. However, special resistance is not necessary. By reversing the battery terminals and allowing the line current to flow in the reverse direction the lamp bank used ordinarily for regulation may be used for discharging. The lamps will have the sum instead of the difference of the line and battery voltages impressed on them and will burn very brightly, but 110-volt lamps on a 110-volt circuit with a 6-volt battery will not be damaged. The discharge current will increase over the charging current in the ratio of the increased lamp voltage, and it may, therefore, be necessary to cut out a few lamps.

◆ A Yard Stick for Measuring Plant Performance

Every boiler plant should have a set of tests conducted in order to establish a characteristic operating chart and when burning the grade and size of coal that is generally used in the plant. These tests will then establish the characteristic curve of the plant and what the requirements will be at different loads in the boiler. When the plant is working, say, 50 per cent above normal operation, the operator should be in a position to know the amount of coal that should be fed to the furnaces, the increased air volume that would be required to burn this amount of coal, what the draft for the particular boilers should be, and an endeavor should be made to maintain these conditions, because he will know then that when operating under these conditions the highest economy can be obtained.

It was difficult a few years ago to get the management interested in making the investment in instrument equipment to place on the boiler units so that all of these conditions could be established and under the control of the operator. Probably the reason for this was due to the fact that a large number of plants purchased one or more instruments, and as soon as the novelty wore off the instruments were left to go without attention, with the result that it wasn't long before a visit by the manager indicated that they were of no use. He was right, for an instrument that is not kept in proper repair and enough interest placed in what it indicates is not worth purchasing and going to the expense of putting into a plant.

Boiler room instruments, however, and their use should not be condemned on this account. There is no question but what the trend is for even more minute control of the boiler room than has been in the past.

◆ Lubrication of Stokers Is Important

Modern stoker equipment is quite rugged and also is reliable but should be given careful attention, since the operating parts are subjected to severe service conditions.

Stoker gears should be protected from dust and should be cleaned and lubricated regularly. Wear can be materially reduced by keeping all accessible bearing and sliding surfaces well greased even where no special provision is made for lubrication. The stoker engine (or turbine or motor) and the drive should be protected from dust as fully as possible and be kept well lubricated.

Most manufacturers have succeeded in making their links, bars and other rapidly wearing parts, especially those which are close to the fire, easily replaceable and operators usually keep extra parts on hand.

When overhauling, the stoker should be put in the best condition possible by cleaning and by replacing parts showing unusual wear. All supports, shafts and other parts should be examined for alignment and straightened, if necessary. All air ducts and windboxes should be examined for leakage.

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TECHNICAL DEVELOPMENTS

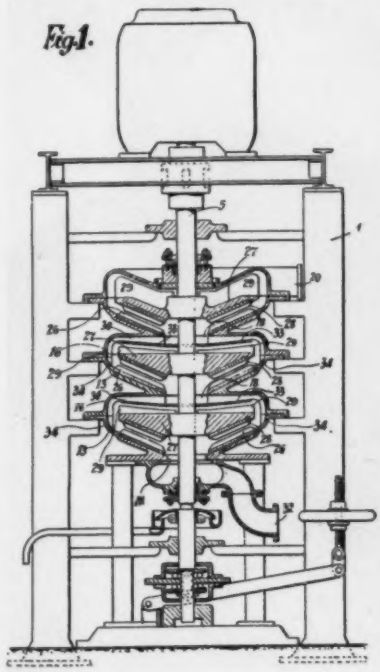
The following abstracts are of the latest developments found in the foreign press.

IN THE PAPER INDUSTRY

◆ Vertical Hydrator

The machine is made up of a series of rotating discs mounted one above another on a vertical shaft. These discs have suitably ridged plates on their under surfaces and impeller blades on the upper faces. They are mounted inside a casing similarly equipped with stationary ridged plates and stationary guide blades. The pulp is pumped in under pressure at the bottom and forced upward, passing from the center toward the outside between the ridged hydrating plates on the under side of the

Fig.1.



rotating discs and those on the upper side of the stationary members of the shell. From the outside it is turned radially toward the center and on to the next pair of hydrating surfaces and so on until it reaches the top where it is discharged.

In order to prevent lodgment of the pulp on the upper faces of the rotating discs, with consequent cessation of movement toward the center, a cupped diaphragm is provided. This, together with the stationary guide blades, forms channels which are higher toward the center, by reason of the bowl-shape of the diaphragm, than at the circumference. This arrangement compensates for the reduction in area as the center is approached and thereby insures a uniform rate of flow of the pulp through the machine.

In the accompanying drawings which illustrate the invention:

Figure 1 is a vertical section of the assembled machine.

Figure 2 is a plan view of the lower side of one of the stationary hydrating plates.

Figure 3 is a plan view of a part of the casing looking from above.

Figure 4 is a plan view of one of the rotating discs.

The machine shown in the illustrations comprises a frame (1) in which is mounted a vertical shaft (5) provided with three rotating discs (27) each scooped out conically and provided with hydrating plates (28) on the under surface, and on the upper surface with radial impeller blades curved like the handle of a ladle. The rotating plates (28) work against the plates (26) which are mounted on, or machined out of, the upper faces of the stationary discs (13). These are hollowed out conically toward the central orifice (18). The two stationary discs (13) are provided on top with rims (16) concave toward the bottom. These are attached solidly to the casing. The under surfaces of rims (16) are opposite the upper sides of the rotating discs (27) and are provided with radial guide blades (30) shaped like a ladle handle.

The pulp is forced through the inlet pipe (32) by a pump (not shown) passing upward through the machine to the top where it leaves by outlet (20). During its passage through the machine the pulp progresses radially toward the outside between the co-acting plates (26) and (28), then radially toward the interior along the upper sides of the rims (16), then through one of the central orifices (18) to the plates (26) and (28) situated immediately overhead, and so on.

A diaphragm (33) like a disc or tray is united to the lower edge of the guide blades (30) in order to delimit with them the path of the pulp from the periphery of each rim (16) to the central orifice (18) of the stationary disc. Each diaphragm (33) extends beyond the internal extremities of the guide blades (30) in order to separate the orifice (18) from the upper face of the corresponding disc (27). The impeller blades mounted on the rotating disc (27) are under the diaphragm (33) and separated by it from the guide blades (30) on the rim (16). These impeller blades exert their action toward the outside, preventing lodgment of pulp under the diaphragm. Ribs, or wings (34), are fashioned on the circumference of the stationary member (13), forming prolongations of the guide blades (30) on the rim (16).

The guide blades (30) of the rim (16) are much deeper toward the center than at the periphery. The diaphragm is shaped like a basin and thus forms with the blades channels for the pulp which are deeper toward the center than at the circumference.

During the functioning of the machine the pulp rises under pressure toward the central orifice (18) in each stationary disc (13) and is forced toward

Fig.2.

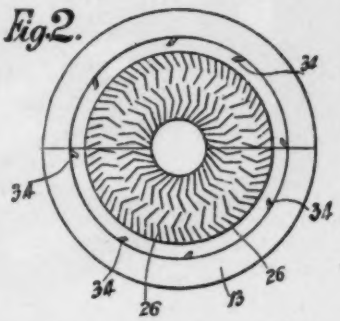


Fig.3.

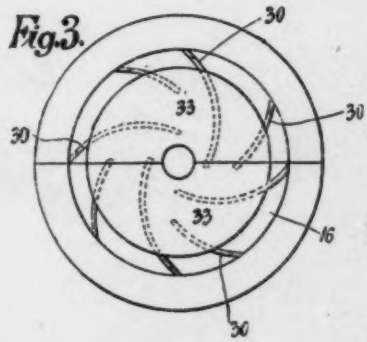
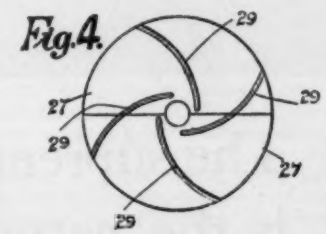
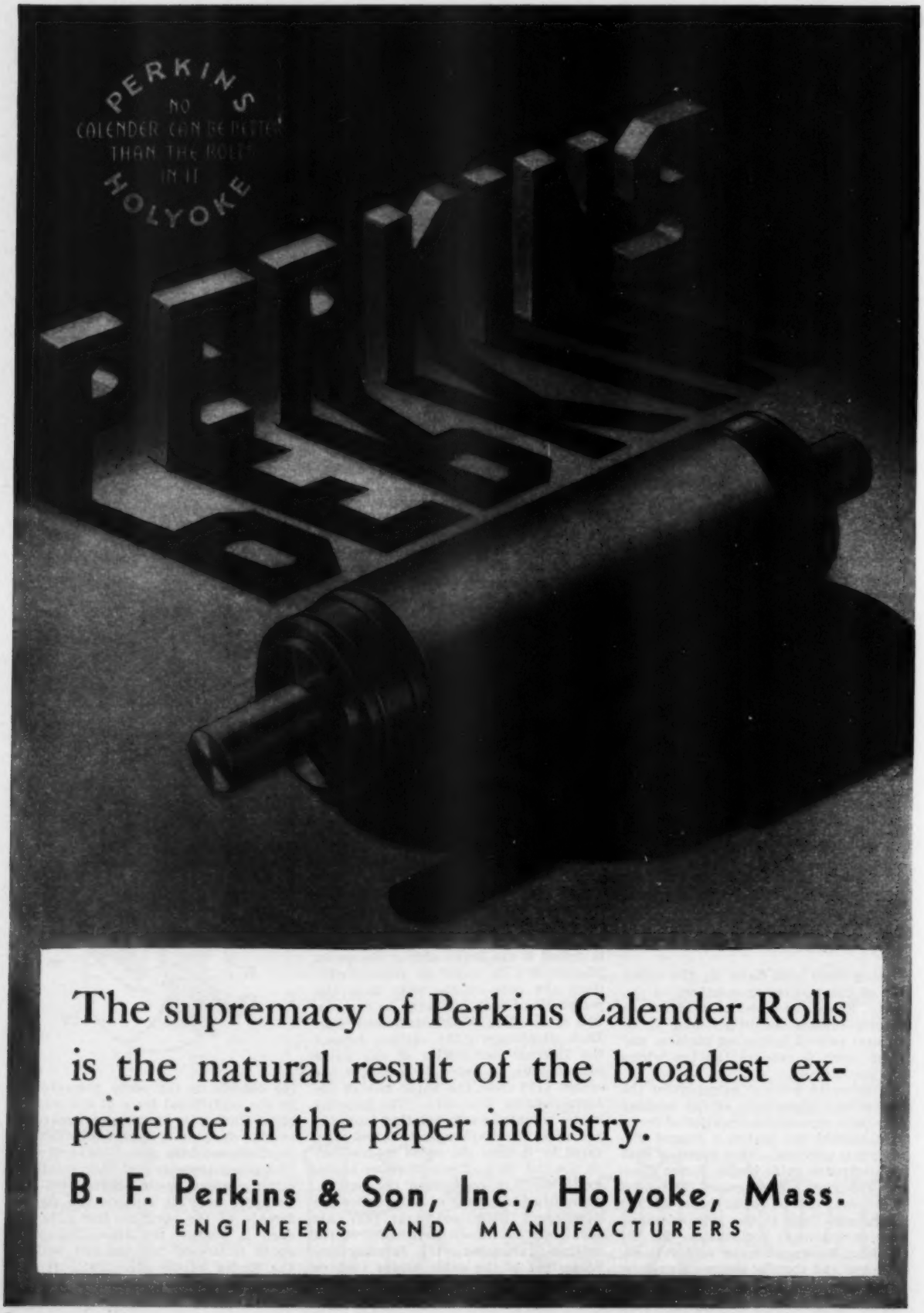


Fig.4.



the outside by the pump pressure and by the centrifugal force of the rotating disc. During its progression toward the outside the pulp is hydrated by the conjugal action of the plates (26) and (28). The pump pressure and the centrifugal action continue to exert themselves upon the pulp after it reaches the circumference of the rotating disc (27) and dash it against the ribs (34) which guide it toward the top and between the blades on the rim (16). It then continues through the channels bounded by the blades (30) and the diaphragm



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ENGINEERS AND MANUFACTURERS

(33) until it reaches the central orifice (18) situated directly above. Through this it flows to the next pair of hydrating plates (26) and (28). The pulp is kept from escaping from the ribs (34) and the extensions of the guide blades on the rim (16) by the action of the impeller blades (29) on the upper face of the rotating disc (27). This action overcomes any tendency for the pulp to enter and lodge between the upper face of the rotating disc (27) and the lower side of the diaphragm (33).

The increase in depth toward the center of the channels for the pulp formed by the blades (30) and the diaphragms (33) compensate for the decrease in area due to convergence. Consequently the pulp flows at uniform speed through these channels. Alternate guide blades are shorter than the rest (cf. Fig. 3) in order to avoid chokes.

French Patent No. 795,035 to Frank Lord of England. From La Papeterie, April 25, 1936, p. 355.

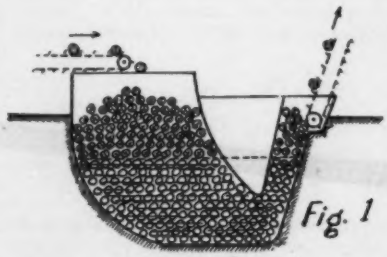
◆ High Alpha-Cellulose Content of Sulphate Pulp

By the action of caustic soda lye in various amounts and concentrations it is possible to obtain high content of alpa-cellulose, up to 97.3 per cent, with concentrated NaOH. The lignin content remains strangely uniform (some 0.6 to 0.9 per cent) and is not reduced. On these grounds after-bleaching with hypochlorites is indispensable.

Audun Moller, Det Kongelige Norske Videnskapers Selskab Bd. 7 Nr. 45, p. 161 (1935), through Die Zellstoff-Faser, April, 1936, p. 58.

◆ Preparatory Handling of Wood for the Barking Drum

The use of barking drums has increased among mills which use freshly cut wood or wood that has been floated to the mill and kept from drying out before use. Mills that receive wood by rail and allow it to dry out in storage



find the bark clings more closely so that a mere tumbling together is inadequate unless unduly prolonged. For such wood the knife barker has not yet been satisfactorily displaced by the barking drum.

In a number of mills it has been the custom for some time to soak the wood before barking in order to soften or loosen the bark. Because too long a soaking period is required at ordinary temperature the water has often been heated by exhaust, or even live, steam. Also hot waste liquors from the digesters or alcohol plant have been used. It was found that for reasonably quick action a fairly high temperature (85-90 deg. C.) is required.

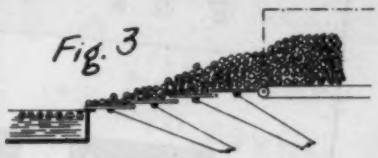
Steaming under pressure in closed drums (Korpi system) has been used but has the disadvantage of batch operation and also causes some discoloration of the wood. A method of floating the wood through heated water in a series of chambers has been used with the idea that the wood must not be allowed to dry out after the bark has been softened. In Figure 1 is shown an arrangement for this purpose. By its design the wood is forced to pass down through a mass of hot water and under a baffle wall before emerging to the conveyors that feed the barking drum. In its passage through this apparatus the wood is subjected to a certain amount of rubbing underneath the water which aids in softening or loosening the bark. This system has the advantage of continuous operation. The duration of treatment is governed by the rate of feeding in the fresh bolts and by the size of the chamber.

Another arrangement with combined wet and hot treatment has already passed the experimental stage and a number of units are in actual operation. It is

called the RNA system and combines treatment at 85-90 deg. C. with heat economy. The treatment takes place in a large lengthy closed chamber through which the wood passes on a chain conveyor. Referring to Figure 2, the wood enters at (4) and leaves at (10) at each of which places a flap with counterweight serves to retain the heat in the chamber. Heat in the form of steam or hot water enters at (5) and is absorbed by the cold water sprayed in at (6). This water cools off the wood before it leaves the chamber and collects in a pool at the outlet and is pumped to sprays shown at (8) which serve to preheat the incoming wood. The wood is discharged into a water-filled vat (9) from which it is conveyed to the barking drum. For better heat economy the chamber is divided into sections by partitions (not shown), the hottest zone being in the middle.

Since the wood is not submerged, as in the preceding system, but is only sprayed with water, danger of discoloration is avoided. This discoloration is thought to result from tannins. According to basic patents covering this process the bark loosening can be further promoted by certain chemicals. For examp'e, SO_2-gas from the gassing down of a digester can be blown in at 5. Similarly hot sulphite black liquor may be used.

The removal of the treated bolts from the chamber can be effected in various ways, for example, by a drag chain with lugs which engage the bolts one at a time. One very interesting arrangement is shown in Figure 3. It comprises a series of shaking tables arranged in steps the highest of which receives the bolts from the treating chamber. These tables are given an undulating motion by a drive mechanism not shown. Both



the height and frequency of the motion can be controlled by a suitable adjustment thus governing the rate of handling of the bolts. From the lowest table the wood falls into a vat of water from which it floats into the barking drum. This system provides complete mechanical handling throughout the preliminary treatment designed to assure production of clean wood in the barking drum.

W. Schmid. Special number, 1936, Wochenblatt fur Papierfabrikation p. 226.

◆ Spots in Paper

Spots in paper at first thought due to slime were found caused by too low consistency of stock flowing onto the wire. Some of the table rolls drew too much water by capillarity through the wire and at the high speed of the machine the centrifugal force of the table roll flung drops of water back through the wire, disturbing the formation. Stopping some of the table rolls prevented this, thereby proving the cause. Reducing the amount of water supplied with the stock to the pond cured the difficulty. Another cure is to insert baffle-boards between the table rolls, thereby preventing the flinging upward of drops against the wire.

From Wochenblatt für Papierfabrikation, 1935, No. 33, p. 626, through La Papeterie, Feb. 25, 1936, p. 164.

◆ Foam Killer

Spots in paper are often due to scum formed on the wire as a result of foaming caused by soaps of fatty or resin acids, or by decomposition products of cellulose, starch, or albuminous products such as glue or casein. The common practice of adding some oil or grease of either mineral, vegetable or animal origin, is expensive and may be attended with difficulties. The inventor claims the amount of oil or grease necessary to kill foam may be very considerably reduced by addition of certain volatile organic solvents such as ketones, esters, phenols, alcohols and hydrocarbons or their mixtures. Furthermore, sulphonated fatty acids, such as madder oil, are particularly effective, especially when foaming is due to the presence simultaneously of soaps of fatty and resin acids and of decomposition products of cellulose and bodies of an albuminous nature.

Example: In one instance of a col-

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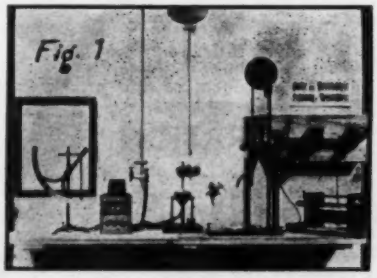
ored paper heavily sized in the beater with both rosin size and glue, scum spots were produced in the paper in consequence of prolific foaming in the beater. This was instantly corrected by the addition to the beater for each 100 kilos of pulp of 50 grams of an oil composed of 60 per cent vaseline oil, 16 per cent cyclohexane, 10 per cent decane, 12 per cent amyl acetate and 2 per cent madder oil.

Fr. Pat. 793,173 to F. Schacht (German) through Le Moniteur de La Papeterie Francaise, Mar. 1, 1936, p. 110.

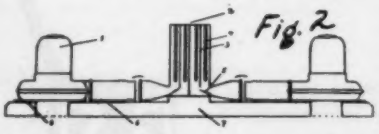
◆ Proposed Quick Drying Method for Moisture Tests on Pulp Sheets

In addition to the standard method of drying pulp samples to constant weight at carefully regulated temperatures, there is often need for equally accurate quick results. This is readily accomplished by preparing the samples in sheet form and exposing them to a blast of warm dry air.

A simple inexpensive equipment for this rapid drying is shown in Figure 1 at the right. Two Sirocco-type hot blast fans (1) are combined with a drying



chamber as shown in Figure 2. This chamber (2) is made of tinplate soldered to sheet iron partitions as shown. Two separate drying compartments are connected with each blower. They are 10-15 mm. wide and provided with brass sieve pockets (4) to receive the damp pulp sheets. These individual compartments



can be cut off from one another by a damper (5). The size of the drying chamber depends on the desired sheet size. In this particular case the measurements are so proportioned that a round sheet of 12 cm. diameter can be exposed to the hot blast on both sides. The whole apparatus is mounted on a wooden board (7) covered with asbestos (6).

Several drying experiments were made with pulp sheets couched from an 80 mesh wire on to a Manchon felt on the under side of a metal template (seen in Figure 1) after sucking off with a water-jet suction pump the residual water from the pulp used in a freeness test. These pulp sheets weighed about 17 g. but contained only 2 g. oven dry fiber. In order to remove as much water as possible before drying in the hot blast a hand wringer was devised. This is visible at lower right in Figure 1. The upper roll, turned out of stainless steel, is subjected to pressure by a lever operated with the left hand while the right hand turns the crank. The lower roll is rubber covered. The moist sheet is placed between two felts and inserted between the rolls while the upper one is raised. Then while pressure is applied the sheet is passed back and forth several times in order to squeeze out as much water as possible. Both the wringer and the drying apparatus can be made in any work shop at small cost.

Comparative tests showed the wringer removes 75 to 80 per cent of the 15 g. water contained in the pulp sheet while the old-fashioned copy-press used for this purpose in some laboratories removes but 50 per cent. Similar comparison between the hot blast dryer and the usual unventilated oven showed the latter required 50 minutes to evaporate the 15 g. water, drying to constant weight at 105 deg. C., while the former accomplished this in 20 minutes at 95 deg. C. After squeezing in the wringer the 3.3 g. water retained by the pulp required 15 minutes in the standard oven and only 5 minutes in the hot blast for complete drying.

After a little practice it is not difficult to complete the freeness-test correction by accurate determination of dry weight of sample in not over 10 minutes from the time the sample is taken. Another very useful application is in the Johnson Bjorkman permanganate test for which accurate knowledge of the weight of dry pulp is very necessary. Also the method and equipment are useful in quick determination of consistency at various points in processing the stock and even for moisture tests on the finished paper.

Dr. Walter Brell, Special Number, 1936, Wochenblatt für Papierfabrikation, p. 51.

◆ Lignin Products

The author details the improvements which have been made in recent years in the wood fermentation process and the factors involved in economical operation. For the enormous amount of lignin which is continually evolved a still better application must be found. It serves already as fuel, as raw material for sundry manufactures, as filler in the building industry and of late its possible use as a fertilizer base has been investigated. Large scale experiments have shown that from 100 kg. dry wood substance, 25 kg. and more of yeast fodder with an albumin content of 40-50 per cent can be obtained. Tanning material is also possible if oak wood be employed. This is treated in the percolaters in the same way as is hydrolysis of cellulose for sugar.

O. Schaal. Cellulosechemie 16, 7, 1935, through Der Papier-Fabrikant, May 17, 1936, p. 100.

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In far too many plants, pipe is pipe, just as "pigs is pigs"—in other words, pipe signifies traditional, heavy-walled, wrought-steel pipe. In the installation illustrated above, for instance, heavy pipe would undoubtedly have been used in many mills, and as a matter of fact it probably would have been satisfactory from a service standpoint, but—

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PAPERMAKING PATENTS

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Inquiries with reference to any of these patents should be addressed to James Atkins, Munsey Building, Washington, D. C.

Compiled by James Atkins, Registered Patent Attorney

2,037,039—Apparatus for Baling Paper Pulp. John Ekern Ott, Chicago, Ill., assignor to Acme Steel Company, Chicago, Ill., a corporation of Illinois. Application January 23, 1932. Serial No. 588,318. 1 Claim. (Cl. 100—20.) The combination in baling apparatus for paper pulp, of a casing adapted to receive said pulp, a chute adapted to receive said pulp from said casing, means adapted to engage said pulp in said casing for compressing it and advancing it along said chute, said chute having longitudinal slots in its side walls for permitting a flexible binder to be inserted transversely through the pulp in said chute, friction plates pivoted on said chute in registry with said slots to engage said binder and draw it taut along the sides of said pulp during its travel, and means for adjusting said friction plates about their pivots to vary the pressure with which they engage said binder.

2,037,211—Method of Baling Paper Pulp. Arthur Talbot Campbell, Seattle, Wash., assignor to Acme Steel Company, Chicago, Ill., a corporation of Illinois. Application July 28, 1932. Serial No. 625,388. 1 Claim. (Cl. 100—20.) The method of baling paper pulp and the like which comprises the steps of forming an elongated body of compacted pulp, maintaining said body of pulp in intermittent motion, thrusting a needle through said pulp and then withdrawing said needle and inserting a flexible binder through the hole made by said needle, then thrusting said needle through said moving pulp at another point and withdrawing said needle and inserting a portion of said binder through the hole made by said needle at said last-mentioned point, and then drawing taut and securing together the ends of said binder.

2,037,249—Apparatus for Baling Paper Pulp. Chester M. MacChesney, Chicago, Ill., assignor to Acme Steel Company, Chicago, Ill., a corporation of Illinois. Application April 18, 1932. Serial No. 605,830. 2 Claims. (Cl. 100—20.) The combination in apparatus for baling paper pulp, of an elongated chute having longitudinal slots in its opposite walls, means for forming and moving through said chute a mass of paper pulp, a hollow needle movable transversely of said chute through said slots for penetrating the pulp therein, and means located in said slots for frictionally engaging a binder and holding it against the pulp during the travel thereof after it has been inserted through said pulp by threading it through said hollow needle.

The combination in apparatus for baling paper pulp, of a chute, means for forming and moving through said chute an elongated mass of pulp, a cylinder extending transversely to said chute, a piston mounted in said cylinder, a plurality of hollow needles secured to said piston and projecting from said cylinder, said chute having elongated slots in its opposite walls to permit said needles to pass therethrough, means for moving said piston in opposite directions in said cylinder, and supporting means for said cylinder to permit its movement parallel to the longitudinal axis of said chute.

2,037,597—Apparatus for Making Multicolored Paperboards. Charles F. Schaub, Longview, Wash. Application February 15, 1932. Serial No. 593,079. Renewed April 23, 1934. 5 Claims. (Cl. 92—42.) An apparatus for making multi-colored paper boards, comprising a pulp vat, a rotatable suction cylinder journaled in said vat and movable counterclockwise, a superposed cylinder journaled above the first named cylinder and movable clockwise for the travel of a pulp conveying felt, means for introducing pulp into the vat through the bottom thereof, a plurality of partitions arranged in the vat forming several compartments for the passage successively of the pulp from one to the other, a second vat elevated close to the plane of the top of the first named vat, vertically and longitudinally disposed baffles arranged in the second vat, the lowermost of said baffles being stationary, means on the second vat to vertically adjust the other baffles, means for supplying pulp to the second vat, an agitator within said second vat, a slanting flow table between said vats and extended close to the first named cylinder, and an adjustable flow controlling bar arranged in the second vat in confronting relation to the flow table.

2,037,937—Safety Paper and Method of Making Same. Francis L. Simons, Needham, Mass., assignor to George La Monte & Son, Nutley, N. J., a corporation of New Jersey. Application May 9, 1933, Serial No. 670,210. 28 Claims. (Cl. 91—67.95). As an article of manufacture, a safety paper comprising a soluble ferrocyanide and a substance selected from the group consisting of soluble salts of alkaline earth metals and of alkali metals other than an ammonium, the pH value of the finished product being about 6.2 and about 7.3.

2,038,228—Process and Apparatus for Conditioning Sheets of Paper. William H. Leslie, Toronto, Ontario, Canada. Application May 22, 1935, Serial No. 22,750. 5 Claims. (Cl. 34—26). In a device of the class described, the combination of a rack; means for suspending sheets of paper by one edge transversely of the rack in a longitudinal series; an air conduit extending longitudinally of and below the rack having a plurality of air outlets in a series logitudinal of the conduit; and means interposed between the outlets and the paper on the rack movable to direct air jets from the air outlets at different angles to the paper and alternately against opposite sides of the sheets.

2,039,780—Paper Making Machinery. James K. Darby, Dayton, Ohio, assignor to Beloit Iron Works, Beloit, Wis., a corporation of Wisconsin. Original application September 24, 1928, Serial No. 307,966. Divided and this application February 27, 1930, Serial No. 431,734. 16 Claims. (Cl. 92—44). In a paper making machine of the class described having a structure normally disposed within the wire loop, cross lateral cables drawn taut at fixed points within the wire loop to spread said wire over the remote parts, means to secure said cables, and pipe members slidably mounted on said cables substantially greater in length than the width of said wire.

2,040,878—Paper Manufacture. Harold Robert Rafton, Andover, Mass., assignor to Raffold Process Corporation, a corporation of Massachusetts. Application May 2, 1933. Serial No. 669,065. 17 Claims. (Cl. 92—21.) A method of manufacturing paper filled with alkaline filler which comprises providing a fibrous mix comprising alkaline filler, a substantially nonbreakable emulsion of substantially water insoluble sizing material substantially inert to alkaline filler, and being substantially free from any precipitate serving to concentrate the disperse phase of said emulsion formed by two mutually precipitable soluble agents including any such precipitate which of itself would constitute a size, forming a web from said mix, and drying said web. A paper comprising fibrous material, alkaline filler, substantially water insoluble sizing material substantially inert to alkaline filler derived from a substantially nonbreakable emulsion thereof, and being substantially free from any precipitate having served to concentrate said substantially water insoluble sizing material from said emulsion formed by two mutually precipitable soluble agents including any such precipitate which of itself would have constituted a size.

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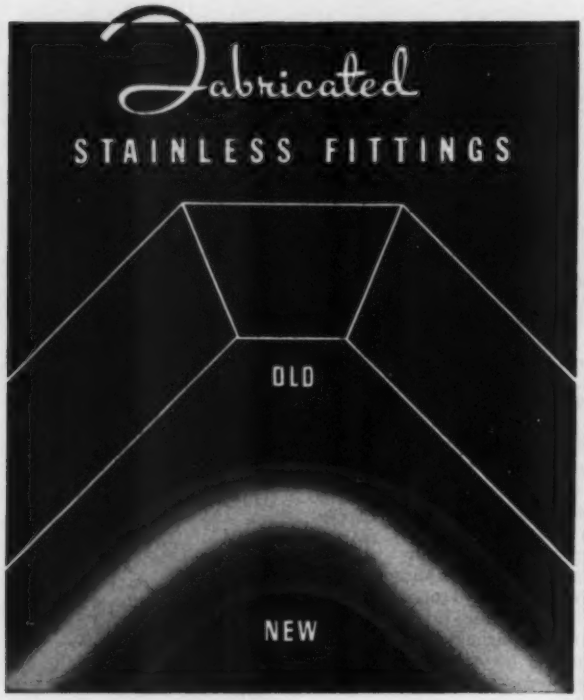

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The COMMERCIAL OUTLOOK

New York, August 1, 1936.

NOT in some years has the production schedule of paper and board mills in the United States been on so high a scale in midsummer as at present. Mills are not alone running at good capacity, they are busy—very busy. Demand for paper of nearly all classes is keeping up to excellent volume, and is gradually growing. Some divisions of the industry are establishing new records of output, and this is saying a great deal for this time of the year, ordinarily a quiet period.

Activity in the paper manufacturing field is nothing more than a reflection of the brisk situation in other lines of industry and trade. Business in a general sense is lively; there is an undercurrent of activity which is most gratifying, and there seems every reason to expect not only a continuance of the prevailing very satisfactory conditions but a further expansion in manufacturing and the movement of goods into consumptive channels. Predictions are made in numerous quarters that the latter months of this year will witness general business back upon the heights of prior to the depression, probably attaining new volume of output and consumption.

Paper sales are mounting steadily. Consumers, converters and jobbers are buying with marked freedom, apparently having discarded all apprehension regarding the future other than that later on they may encounter difficulty in filling their needs. Paper manufacturers actually have reached a stage where they are exercising care in booking forward orders. Most mills have such a volume of commitments on file that they are hesitant to dispose of more of their product, while appreciating that practically every indication with relation to the future progress of business is in their favor.

The fine paper branch of the industry affords a clear insight into the situation existing. The increased general volume of business, necessitating the use of additional writing paper for commercial transactions, invoices and advertising, is responsible for a 15 per cent gain in writing paper sales for the first six months of this year over the similar period of 1935. Orders during July ran 10 per cent ahead of a year ago, a truly unusual development since July is customarily a slow month for the fine paper industry. A steady improvement is expected by manufacturers and it is estimated there will be at least a 15 to 20 per cent increase for the entire year compared with 1935. However, the present profit margin in fine papers is said to be narrow due to the rise in the cost of production occasioned in good part by higher raw material prices and taxes.

Additional uses for waxed paper is given as the reason for the 9.4 per cent rise in shipments of this class of paper during the first six months of 1936 over the corresponding period of last year, manufacturers report. Despite the fact that bread wrappers remain the biggest single item in this industry, there has been a great demand for waxed paper for food covering in refrigerators, due to the strides made in sales by refrigerator producers. Paper in metal edge cutter boxes, carried by grocers, chain stores and paper jobbers, has sold actively.

Production of newsprint in Canada in June continued to soar to new record levels, and United States output also scored some gain. The June production by Canadian mills of 270,051 net tones exceeded the previous high mark for any month this year, or 267,067 tons turned out in May, and was 38,031 tons or 16.4 per cent above the 232,020 tons produced in Canada in June last year, according to figures reported by the News Print Service Bureau. The output for mills in both the United States and Canada did not establish a new high because of the decline in production in the United States in recent years. Mills in the United States in the first six months of this year produced 460,139 tons of newsprint, compared with 461,552 tons in the first half of last year, and the lowest for a first half year since 1933. Canadian mills, on the other hand, produced 1,489,263 tons in the six months, against 1,284,903 tons in the same 1935 period, an increase of 204,360 tons or 15.9 per cent, and a record six months' output for Canadian mills.

Shipments of newsprint from Canadian mills during June were 262,959 tons, and from United States mills 74,710 tons, making an excess of production over shipments of 12,212 tons. This resulted in an increase in mill stocks to 94,226 tons at the end of June, compared with 82,014 tons a month previously, and 74,267 tons at the end of June, 1935.

The output of paperboard in mills in the United States during May fell a little below the April total but was well above the May, 1935, production and far in excess of the production in the same 1934 month. The May output amounted to 289,527 tons of board of all types, against 294,929 tons in the preceding month, 262,463 tons in May a year ago, and 231,107 tons in May two years ago, according to the Census Bureau's monthly summary of the board manufacturing industry.

The May production brought the aggregate for the first five months of the current year up to 1,411,748 tons, showing a sharp increase over the 1,312,980 tons produced in the similar five months of 1935, and a larger gain over the 1,205,052 tons in the first five months of 1934. Board mills produced at 71.0 per cent of their rated capacity in May last, against 71.6 per cent in the month before and 62.7 per cent in May, 1935. During the first five months of this year production was at an average of 68.7 per cent of rated capacity, compared with 65.5 per cent last year and 61.7 per cent two years ago in the same time.

Board mills received new orders in May calling for a total of 280,899 tons of board, contrasted with 298,180 tons in the month preceding and 259,995 tons in the similar 1935 month. Unfilled orders held by manufacturers at the end of May were for 92,784 tons of board, against 99,796 tons a month previously.

Shipments of prepared roofing during May showed a seasonal decrease compared with the preceding month, totaling 2,106,135 squares of all kinds of the product, with 28 manufacturers operating 54 plants reporting, against 2,743,899 squares in April this year, and 2,779,447 squares in May last year, according to the Census Bureau. Shipments during the first five months of the current year totaled 12,108,219 squares, contrasted with 9,792,511 squares in the corresponding period in 1935, and 9,673,867 squares in the same time of 1934.

◆ ◆

◆ Controlled Atmosphere Furnace Installation

One of the first controlled atmosphere furnaces ever to be used for the normalizing of steel tubing has been installed in the Cleveland plant of Steel and Tubes, Inc., subsidiary of Republic Steel Corp.

While this application may be the first for this type of furnace, similar furnaces have for years been used in the heat treatment of copper tubing, copper brazing, razor blades and bright annealing of strip steel.

Although these Electrunite boiler tubes (as the electric welded, controlled atmosphere tubing is known to the industry) are one of the newest developments of the steel industry, and one of the few improvements of recent years in the boiler tube field, millions of feet have already been installed in all types of fire and water-tube boilers, stationary, locomotive and marine. They have an excellent record in service and are readily available from waterhouse stocks in all principal cities.

◆ STEPHENS-ADAMSON MFG. CO., Aurora, Ill., has appointed F. E. Dunlap as branch manager in charge of conveyor sales and engineering for the State of Michigan with offices in the Book Tower, Detroit. Mr. Dunlap has had wide experience in conveyor design.

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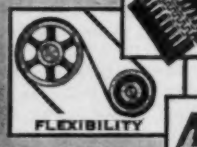

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Domestic RAW MATERIALS

◆ Papermaking Rags

A waiting condition characterizes the market for papermaking rags. Those on the selling side of the market are waiting a revival of demand from consuming quarters; that is, a broadening of the buying movement at least sufficient to give the situation a livelier complexion. There is a certain amount of routine activity, but consumers are doing little else than covering actual and immediate requirements, and in a large majority of cases appear to have accumulated ample inventories to enable them to keep very much out of evidence as purchasers for the present.

Paper manufacturers are not in a buying mood while apparently satisfied to await the development of more definite needs before resuming operations in the rag market on a scale recorded a few months ago. Fine paper mills are placing orders for rags with fair regularity but they are buying in small volume; seldom do their commitments currently involve more than a carload at a time. In short, it is plainly evident that writing paper manufacturers are permitting rag merchants to carry the stocks these days, perhaps to a greater degree than has been their policy during the last several years, keeping their own storehouses fairly bare of rags, and ordering supplies only when urgently in need of raw material.

Roofing paper manufacturers, too, are still out of the market as buyers other than for spasmodic entrances to absorb limited amounts of rags. Roofing mills piled up sizable stocks of rags some time ago and are now refusing to buy except intermittently to augment their supplies There is nevertheless an undercurrent of firmness in the roofing rag market, founded on a fairly bullish supply condition, and predictions are numerous that when consuming demand expands, prices will recover much of the ground lost in the quiet period of the past several months. However, manufacturers seem resolved to refrain from other than very reserved purchasing until they have reduced the stocks accumulated through heavy buying earlier in the year.

Not much change has occurred in quotations on papermaking rags. Certain of the high grades, new cuttings in particular, have moved upward slightly in value, largely as an outcome of the advancement in the cotton market, rag dealers contending they have to pay more at supply sources owing to garment manufacturers demanding higher prices, and therefore marking up selling quotations. Roofing grades have held passably steady, and seem to have struck levels through which mill buyers have difficulty breaking.

New No. 1 white shirt cuttings are quoted at 7.50 to 7.75 cents per pound f.o.b. dealers' shipping points, and in some instances 8 cents is asked, representing a stiffening of prices on these rags. Dealers ask 8 cents for new unbleached muslins, 5.75 to 6 cents for light silesias, 6.50 cents for blue overall cuttings, 2.75 to 3 cents for fancy shirt cuttings, 7.25 cents for bleached canton flannels, 5.75 cents for light flannelettes, 3.75 to 4 cents for black silesias, and 2.50 to 2.75 cents for washables. Roofing stock is quoted in the East at 1.50 cents or higher per pound at shipping points for No. 1 classification packing, and 1.20 cents for No. 2. Old white cottons are 3.25 cents at dealers' points for No. 1 repacked grade, and thirds and blues 2.25 cents for repacked.

◆ Old Paper

With board and paper mills absorbing supplies freely, waste paper exhibits a strong price condition in practically all grades excepting old books and magazines. Shavings are moving well, both to domestic consuming centers and for export, and there is a steady demand for ledgers, kraft, white news, and manilas. Old newspapers and mixed papers are in excellent call, and have scored some price rise. The supply position is firm, dealers reporting that the customary falling off of incoming supplies in the summer is more pronounced than in a long time.

Hard white shavings of No. 1 quality are selling in the East at around 2.25 cents a pound f.o.b. shipping points, No. 1 soft white shavings at 1.90 to 2.10 cents and up to 2.30 cents for one-cut, No. 1 hard white envelope cuttings at 2.50 cents, white ledgers at 1.10 to 1.20 cents, colored ledgers at 85 to 90 cents per hundred pounds, No. 1 old kraft at 1.10 to 1.20 cents, new kraft envelope cuttings at 2 cents, white news cuttings at 1.25 to 1.35 cents, and No. 1 heavy books and magazines at 55 cents a hundred pounds. Folded news has advanced to 37½ to 40 cents per hundred pounds, and No. 1 mixed paper to 30 cents at shipping points.

◆ Rope and Bagging

The market for old bagging is quiet, consumers proceeding cautiously in acquiring further supplies, yet quoted prices hold comparatively steady with dealers and importers complaining of being unable to buy at supply sources cheaper. It would appear as if shredders are purchasing bagging more readily than are paper manufacturers, and apparently are willing to pay higher prices. No. 1 scrap bagging is about 1.65 cents a pound f.o.b. shipping points, No. 1 gunny bagging 1.85 cents, and roofing bagging 1.15 cents. Imported material is well above these levels, the market abroad being reported higher than here, and importers therefore guarding themselves when naming prices to mill customers.

Not much demand is noted for old rope and prices are stationary quotably at about 2.37½ cents a pound at shipping points for No. 1 domestic old manila and 2.50 cents ex dock New York for foreign rope. Strings are moving freely, however, and at firm values, sisal and jute strings at 2 to 2.15 cents per pound and mixed strings at a cent to 1.10 cents per pound.

◆ Pulpwood

A steady movement of pulpwood from producing to consuming centers is reported, and the market has a firm undertone. Cutting has been fairly heavy in Canada this season, reports say, but pulpmakers are taking offered supplies readily and there is a lack of selling pressure. Price levels are maintained.

◆ Mechanical Pulp

Groundwood demand is steady in its development and of fairly broad dimensions. From all indications consumers are filling their requirements without much difficulty but they are faced with a firm price situation and find it necessary to meet quoted rates to secure supplies. Curtailment of output in Europe is having its influence, and there is a distinctly firmer tone in quotations from abroad, which in turn aids the price position in domestic and Canadian groundwood. Domestic groundwood is quoted at $26 to $30 per ton delivered consuming mills, depending on the length of the haul from producing plants, while Canadian prime moist groundwood is quoted at $23.50 per ton ex dock American Atlantic seaboard for pulp brought down by schooners. Scandinavian groundwood has risen to where sales at $25 and slightly higher a ton for dry pulp have been made ex dock New York or other Atlantic ports.

◆ Chemical Pulp

Domestic bleached sulphite manufacturers have announced they will maintain a price of 2.65 cents per pound on their product for the fourth quarter of this year, ex dock American Atlantic seaboard. Demand for such pulp is good, and it is not an easy matter for buyers to procure supplies, since most producers are sold up for some while to come. Kraft pulp is eagerly sought by consumers and is very firm in price. Spot lots have brought 2.25 cents a pound ex dock New York, and perhaps higher, reports alleging sales up to 2.45 cents. The contract basis on domestic prime kraft is in the vicinity of 1.90 cents. Unbleached sulphite is approximately 1.80 or 1.85 cents for domestic newsprint grades and 1.90 cents upwards for prime grades ex dock New York basis.

◆ Chemicals

Papermaking chemical prices are firmly maintained, and the tendency is higher. Casein has advanced to 15.75-16.25 cents a pound for domestic, depending on the grind, and 15.75 to 16 cents for foreign. Papermaking rosin is up to $5.15 per 280 pounds in barrels f.o.b. southern shipping points.

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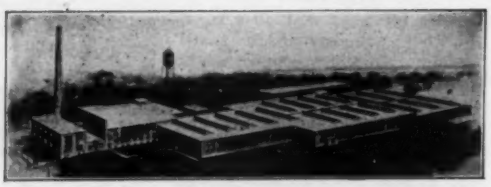

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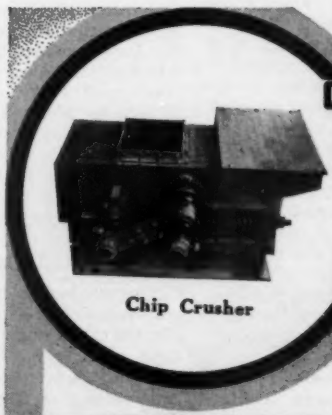

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Import and Export MARKETS

IMPORTS

◆ Wood Pulp

Perhaps never before, certainly not in a long time, has so strong a supply situation existed in wood pulp. It is no exaggeration whatever to say that there is much more demand for chemical pulp than there is pulp for sale.

Producers abroad have sold so much pulp during the last few months they are virtually outsold for this year, and well into 1937; in numerous cases they are completely outsold for the remainder of the current year and as far ahead as they care to commit themselves at present under prevailing market circumstances. On the other hand, American paper and board manufacturers are eager to cover their requirements farther forward, as well as procuring additional supplies for fairly near shipment from abroad. Pulp importers and agents in New York say they are succeeding in getting approximately a third of the tonnage of pulp which they endeavor to purchase in European sources for the account of consuming customers.

The supply condition is especially acute in kraft pulp and in bleached sulphite. These are the grades difficult to secure. Unbleached sulphite also is tightening, from a supply standpoint; it is no longer an easy matter to get easy bleaching qualities of unbleached pulp, and many producers are pulling in the reins on sales of ordinary grades of unbleached sulphite. Scarcely any prime kraft is to be had for the rest of this year, reports say, and for that matter for the first half of next year. Spot lots of kraft are commanding a stiff premium; there have been sales reported up to 2.45 cents per pound ex dock New York or other American Atlantic ports, as against a nominal contract basis of 1.90 to 2 cents on similar pulps for far forward shipment from primary sources in Europe.

Prime bleached sulphite has strengthened in price to where 2.75 cents is regarded as about the minimum at which near supplies can be bought, ex dock American Atlantic seaboard, and quotations range up to 3.10 cents and higher on some special grade pulps. Unbleached sulphite holds to a level of 1.90 to 2.05 cents a pound for prime grades ex dock, and 2.05 to 2.15 cents for easy bleaching sulphites. Prime Scandinavian groundwood is quoted at $24.50 to $25.50 per short ton for dry and $23.50 to $24.50 for moist ex dock New York or other Atlantic ports for shipment from abroad.

Pulp importations into the United States increased fairly sharply during May following several months of comparatively small arrivals, rising to the largest total tonnage for any previous month this year with the exception of January. Chemical pulp imports in May amounted to 148,840 short tons of 2,000 pounds, air dry weight, valued at $5,844,657, according to U. S. Department of Commerce figures, comparing with 108,982 tons of a value of $4,500,996 in the preceding month, and 147,686 tons of a declared value of $5,693,031 in the similar month last year. Groundwood imports were 19,140 short tons in May for a value of $349,705, against 12,415 tons of a value of $227,861 in the month before and 16,400 tons of a value of $289,828 in May, 1935.

Chemical pulp imports during the first five months of this year reached a total of 720,463 short tons, a rise of 131,681 tons or 22.3 per cent compared with 588,782 tons imported in the corresponding period of 1935, while mechanical pulp imports totaled 80,345 short tons, a gain of 15,671 tons or 24.2 per cent over the 64,674 tons in the same time a year ago.

◆ Paper Stock

Importations of papermaking rags into the United States during the first five months of this year were nearly double in volume the arrivals in the similar 1935 period, while receipts of other wastes for papermaking were 64 per cent in excess of last year's imports. Total imports of paper base stocks were valued at $33,765,423 in the five months this year, of which $29,355,824 represented imports of wood pulp, $1,568,244 imports of pulpwood, and $2,841,355 imports of rags, waste and other base stocks, against imports of a total value of $27,236,321 in the corresponding five months of 1935.

Papermaking rag receipts in May were 33,010,387 pounds of a declared value of $581,839, compared with 17,195,176 pounds of a value of $209,220 in the same month in 1935. Imports of miscellaneous paper stock, comprising old rope, bagging, waste paper, etc., were 10,376,792 pounds of a value of $166,880 in May last, against 8,964,943 pounds of a value of $115,834 in the similar 1935 month.

◆ Paper

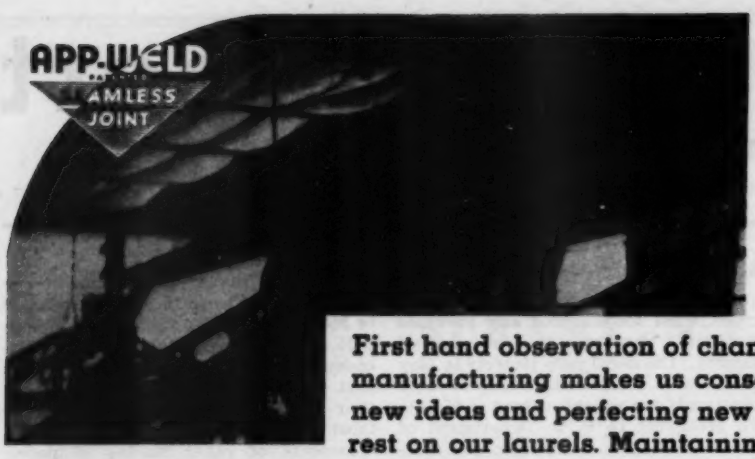
Imports of paper and paper products into the United States in May last reached a total value of $10,257,733, according to U. S. Department of Commerce statistics, comparing with $8,188,893 in the preceding month, and $8,925,912 in May last year. Arrivals of newsprint, which make up the bulk of our paper imports, were 15 per cent heavier in May than during the same month in 1935, and approximately the same increase was registered in imports for the first five months of this year over a year ago. The five-month imports totaled 1,024,247 tons, valued at $35,566,215.

Imports of other classes of paper, valued at $925,112, dropped off 7 per cent in value during May, but receipts for the five months, which aggregated $5,195,650, were 18 per cent above those for the corresponding five months in 1935. Imports of most classes of paper were larger than in the same period last year, with the largest increases in volume of receipts occurring in kraft and other wrapping papers, and printing papers exclusive of newsprint. Aggregate imports of paper and paper products during the first five months of 1936 were valued at $40,761,865, against $35,333,760 during the corresponding five months in 1935.

EXPORTS

Exports of paper and paper products from the United States continue to record a rise in aggregate value except for seasonal fluctuations. Shipments during May last were valued at $1,981,110, according to U. S. Department of Commerce reports. This figure represents the highest amount for any one month since May, 1931, and exceeds the value of exports for the corresponding month of 1935 by 17 per cent. The volume of shipments during May was also unquestionably larger than during May, 1935. Nearly all classes of paper contributed to this increase. Larger shipments in a number of paper items, however, were not sufficient to offset the tonnage in earlier months or years, and while total exports for the five-month period exceeded those for the similar period of 1935 by 11 per cent, all classes did not share in this increased trade. Among the exceptions were exports of printing and writing papers and some classes of board. Total exports of paper and paper products for the five months were valued at $9,265,788, against $8,360,096 during the corresponding months last year.

In addition to its paper and paper manufactures, the United States exported $870,782 worth of paper base stocks during May, bringing the total for the first five months of 1936 up to $4,341,084. Shipments in this line were in excess of those for the same month last year, but were insufficient to bring the total for the five-month period up to the level of the same time in 1935.



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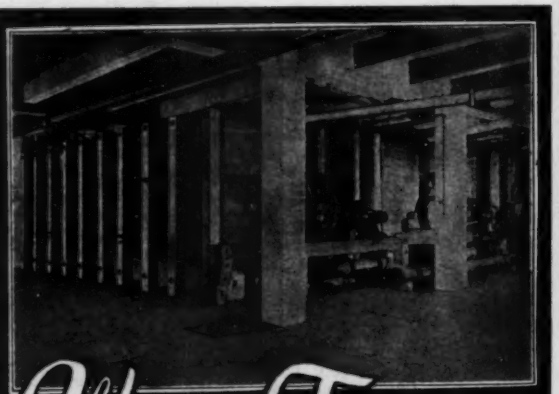

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